CALENDAR NO. 282

64TH CONGRESS, 1st Session | SENATE | REPORT No. 306

CARE AND TREATMENT OF PERSONS AFFLICTED WITH LEPROSY

REPORT

OF THE

COMMITTEE ON PUBLIC HEALTH AND NATIONAL QUARANTINE UNITED STATES SENATE

ON

S. 4086

A BILL TO PROVIDE FOR THE CARE AND TREATMENT OF PERSONS AFFLICTED WITH LEPROSY, AND TO PREVENT THE SPREAD OF LEPROSY IN THE UNITED STATES

PRESENTED BY MR. RANSDELL

MARCH 25, 1916.—Ordered to be printed, with illustrations

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CARE AND TREATMENT OF PERSONS AFFLICTED WITH LEPROSY.

MARCH 25, 1916.—Ordered to be printed.

Mr. RANSDELL, from the Committee on Public Health and National Quarantine, submitted the following

REPORT.

[To accompany S. 4086.]

The Committee on Public Health and National Quarantine, to whom was referred the bill (S. 4086) to provide for the care and treatment of persons afflicted with leprosy, and to prevent the spread of leprosy in the United States, having considered the same, report it back favorably with certain amendments, and, as amended, recommend its passage.

Strike out section 5, on page 3, and insert in lieu thereof the following:

SEC. 5. That when any commissioned or other officer of the Public Health Service is detailed for duty at the home herein provided for, he shall receive in addition to the pay and allowance of his grade one-quarter of the pay of said grade.

The bill, as proposed to be amended by your committee, is as follows:

[S. 4086. Sixty-fourth Congress, first session.]

A BILL To provide for the care and treatment of persons afflicted with leprosy and to prevent the spread of leprosy in the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of carrying out the provisions of this act the Secretary of the Treasury is authorized to select and obtain, by purchase or otherwise, a site suitable for the establishment of a home for the care and treatment of persons afflicted with leprosy, to be administered by the United States Public Health Service; and either the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, of the Secretary of Agriculture is authorized to transfer to the Secretary of the Treasury any abandoned military, naval, or other reservation suitable for the purpose, or as much thereof as may be necessary, with all buildings and improvements thereon, to be used for the purpose of said home or homes.

SEC. 2. That there shall be received into said home, under regulations prepared by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, any person afflicted with leprosy who pre-

sents himself or herself for care, detention, and treatment, or who may be apprehended under authority of the United States quarantine acts, or any person afflicted with leprosy duly consigned to said home by the proper health authorities of any State, Territory, or the District of Columbia. The Surgeon General of the Public Health Service is authorized, upon request of said authorities, to send for any person afflicted with leprosy within their respective jurisdictions, and to convey said person to such home for detention and treatment, and when the transportation of any such person is undertaken for the protection of the public health, the expense of such removal shall be paid from funds set aside for the maintenance of said home or homes.

SEC. 3. That regulations shall be prepared by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, for the government and administration of said home and for the apprehension, detention, treatment, and release of all persons who are inmates thereof.

SEC. 4. That the Secretary of the Treasury be, and he is hereby, authorized to cause the erection upon such site of suitable and necessary buildings for the purposes of this act at a cost not to exceed the sum herein appropriated for such purposes.

SEC. 5. That when any commissioned or other officer of the Public Health Service is detailed for duty at the home herein provided for he shall receive in addition to the pay and allowances of his grade one quarter of the pay of said grade.

SEC. 6. That for the purpose of carrying out the provisions of this act there is hereby appropriated, from any money in the Treasury not otherwise appropriated, the sum of $250,000, or as much thereof as may be necessary, for the preparation of said home, including the erection of necessary buildings, the maintenance of the patients, pay and maintenance of necessary officers and employees, until June thirtieth, nineteen hundred and seventeen.

The committee is of the opinion that for the protection of the public health, the humanitarian treatment of persons afflicted with leprosy, and the furtherance of the scientific study and investigation of the disease, Congress should provide a home or homes for the care and treatment of persons afflicted with leprosy. At the hearing which was held by the committee it was shown by the testimony of competent expert witnesses that leprosy exists in practically every State in the Union; that the disease has been present in the United States for a considerable number of years; and that it is on the increase. It was further shown that the treatment which is at present accorded to lepers by the general public is in many instances most inhumane and cruel, and that there exists in the United States only three institutions which are maintained solely for the purpose of treating lepers. The experts before mentioned, many of whom have devoted many years to the careful study of the disease, were unanimous in stating that the only known means for effectively controlling the spread of leprosy is segregation. Many of the lepers in the United States wander about the country seeking an asylum, and in this way they engage in interstate travel, and hence fall within the jurisdiction of the Federal Government. They frequently have no place of legal residence, and it is therefore impossible to decide which State shall be responsible for their care and treatment. As a result those States which maintain leprosaria have placed upon them the burden of taxation for the care of lepers who are not legal residents within their jurisdiction.

It was clearly shown by the testimony which was given at the hearings that the incubation period of leprosy is very long, sometimes as many as 30 years elapsing between exposure to the disease and the development of symptoms. It therefore follows that it is exceedingly difficult to remand these prospective lepers at ports of entry. On account of the insular possessions of the United States and the closer

commercial relations existing between the United States and those countries in which leprosy is prevalent, the importation of the disease is very apt to occur. In addition to this, American citizens are constantly going abroad and residing for variable periods of time in places in which leprosy exists, and in many cases which were brought to the attention of the committee it was clearly shown that leprosy had in this way been contracted and subsequently imported into the United States.

Leprosy is a communicable, loathsome, mutilating, chronic disease. At the present time, because of the public fear of leprosy and the inadequate accommodations for the care and treatment of those suffering therewith, it is exceedingly difficult to state the number of persons in the United States suffering with this disease. The estimates given at the hearing varied from 500 to 2,500. The experts who testified before the committee were of the opinion that if the lepers in the United States were segregated at the present time, the further spread of the disease would be completely controlled and the problem reduced to insignificant proportions in a relatively short space of time. It was shown that in other countries the establishment of national leprosaria had effectively eradicated leprosy.

The hearings on this bill, with photographs, are annexed hereto, and made a part of this report.

In view of the foregoing, the committee therefore recommends that the bill be passed.

HEARINGS

BEFORE

THE COMMITTEE ON PUBLIC HEALTH AND NATIONAL QUARANTINE UNITED STATES SENATE, SIXTY-FOURTH CONGRESS, FIRST SESSION, ON S. 4086, A BILL TO PROVIDE FOR THE CARE AND TREATMENT OF PERSONS AFFLICTED WITH LEPROSY AND TO PREVENT THE SPREAD OF LEPROSY IN THE UNITED STATES

COMMITTEE.

JOSEPH E. RANSDELL, Louisiana, *Chairman.*

DUNCAN U. FLETCHER, Florida.	REED SMOOT, Utah.
ROBERT L. OWEN, Oklahoma	JOHN D. WORKS, California.
CHARLES A. CULBERSON, Texas.	JAMES H. BRADY, Idaho.
J. C. W. BECKHAM, Kentucky.	JOHN W. WEEKS, Massachusetts.
OSCAR W. UNDERWOOD, Alabama.	CHARLES E. TOWNSEND, Michigan.

RUFUS W. FONTENOT, *Clerk.*
JOS. M. RAULT, *Assistant Clerk.*

PREFACE.

The following pages contain the testimony given at a hearing held by the Committee on Public Health and National Quarantine of the Senate on February 15 and 16, 1916, on the bill (S. 4086) to provide for the care and treatment of persons afflicted with leprosy, and to prevent the spread of leprosy in the United States.

The testimony here recorded was given by physicians of national and international reputation, by missionaries, by sanitarians, and others conversant with the distribution and spread of the disease which has been so long the scourge of the human race that its history loses itself in the mists of antiquity.

The evidence clearly shows that leprosy is a chronic mutilating disease, whose victims inspire such a horror in the public mind that they are ostracized, harried from place to place, at times being locked up like common criminals, and at others undergoing treatment which for refinement of cruelty is worse than death itself. It is brought forth clearly that the disease is widespread in the United States to an extent that is little realized. Some of the witnesses testified that the disease is on the increase, and all agreed in the statement that segregation is the only effective means for the eradication and prevention of leprosy. The witnesses also unite in agreeing that on humanitarian and economic grounds the only way in which to attack the leprosy problem in the United States is through the erection and maintenance of a national home for lepers. Not only is this the most humane way in which the unfortunate sufferers from a loathsome communicable disease may be treated, but it is also the most economical, because the overhead costs of caring for 100 lepers is not very much greater than the overhead cost for caring for 20 lepers. All of the State health officers are in favor of the bill, and it has the official indorsement of the American Dermatological Association, the American Medical Association, the American Academy of Medicine, and the conference of State and Territorial health authorities.

The incubation period of leprosy is very long, sometimes as many as 30 years elapsing between exposure to the disease and the development of symptoms. It is, therefore, practically impossible for the United States to exclude cases at quarantine unless they are in the active stage of the disease. As a result our people are going abroad, particularly to the Orient, becoming infected, returning home, and developing the disease many years afterwards. This is particularly shown with regard to soldiers who have served in the Philippines.

Communities are, as a rule, absolutely unprovided with proper means for the care, segregation, and isolation of lepers. At the present time there exists no national institution for the reception and care of lepers in the continental United States. Lepers do not desire to escape from well-conducted leper settlements, and there is no

danger to surrounding communities from a leper home, provided the home is well conducted.

Aside from the cruelties which are now imposed on the poor leper himself, scientific men are deprived of a place in our country where leprosy may be studied in all of its manifestations, and means for its cure and amelioration sought. A national home for lepers would not only be a haven of refuge to the diseased person himself but would also be a great scientific workshop wherein clinical and laboratory workers could focus their energies on the conquest of one of the most terrible diseases which afflicts man.

The evidence which follows brings out the striking fact that lepers are constantly engaged in interstate travel, and thereby constitute a menace to the public health. In many instances it has seemed well-nigh impossible to determine the residence of these lepers, and they move from place to place, becoming an economic burden on communities on which they have no rightful claim. Since the Federal Government exercises control over interstate commerce, it is the duty of the General Government to see to it that the States take no harm through such commerce. In this instance it becomes the duty of the Federal Government to see to it that the States take no harm through leprosy which is undergoing interstate transportation.

There is no doubt a constantly increasing tendency by physicians not to report cases of leprosy which are diagnosed as such. The outrageous treatment accorded lepers by a public possessed of a leprophobia, the newspaper notoriety which inevitably ensues whenever a case is reported, and the harrowing and frightful experiences which lepers are obliged to undergo, have caused physicians to seriously object to reporting cases to the health authorities. One physician testified that he and his coworkers had agreed, following the impression made upon their minds by the harrowing experience which one of their cases had undergone, to never again, until proper facilities were provided for the humane care of their cases, declare a man a leper. If we are to believe the testimony of the experts who have appeared before us this will inevitably tend to further increase the number of cases of leprosy. Those who are familiar with the leprosy situation in the United States undoubtedly realize that even at present this unwillingness to report instances of infection by physicians and health organizations is in part responsible for the spread of the disease.

The testimony of the medical witnesses summoned before us goes to prove that we must rely upon segregation and isolation of those afflicted for protection against this disease. Unfortunately the scientific world is as yet ignorant of the means of transmission from individual to individual. Whether the conveyer of the infection is a blood-sucking insect, or whether the organisms are introudced into the system in some manner by inoculation, is quite unknown. Theories have been advanced again and again, in each instance either to be discarded or merely to be retained as a theory after every means of establishing proof has been exhausted. The brightest medical minds of centuries have grappled with the problem, but in vain. It is true that advances have been made, and we should not forget that we owe to Nansen the discovery of the bacillus, and to one of our own Americans, Clegg, the honor of having first grown the

organisms in artificial media, each of these accomplishments being a long step toward establishing a cure. But until the day arrives, and there is no doubt in the minds of many that the time will soon come, when we can protect the public by curing the individual, we must altogether rely upon segregation as a prophylactic measure.

It is fortunate, indeed, that in segregation we have a method of protection which, if utilized, is wholly sufficient to prevent the dissemination of the disease. There can be no doubt on this point. Not only have we the testimony of the experts who appeared, but the historical facts themselves warrant that conclusion. Wherever segregation has been thoroughly tried, irrespective of the amount of infection present when instituted, it has resulted in a diminution, if not a total eradication, of the disease. Europe was freed of the infection in the Middle Ages through segregation alone, and our own results in the Hawaiian Islands and the Philippines clearly indicate that in time these areas, which previously have been hotbeds of the infection, will be entirely freed from the disease. If such results can be obtained in districts where the disease has been rampant, it is reasonable to conclude that by the adoption of similar preventive measures the infection can be eradicated from the entire Nation.

Leprosy was known to the world long before the Christian era. In the ancient writings of the Chinese, Syrians, and Egyptians there are allusions to a fatal, disfiguring affection which we are warranted in assuming was the same as the dreaded scourge of to-day. Throughout the east the disease was rampant. At the time of Christ the cry of "unclean" was as familiar to the ears of the multitude as is the most common word of warning in our language of to-day. The edicts of earlier years, "All the days wherein the plague shall be in him he shall be defiled; he is unclean; he shall dwell alone; without the camp shall his habitation be" prevailed, and the mutilated forms of the afflicted huddled about the gates of every city of Palestine.

The earlier Greeks knew little of leprosy. Hippocrates, in whom the medical wisdom of the ages seems to have centered, barely mentions it in his writings, and to him it must have been a rare and exotic affection. Aristotle, however, described it vividly. It is, therefore, a reasonable conclusion, unless we are willing to accord to Aristotle greater discernment in medical matters than we grant to Hippocrates, that some time during the half century which existed between the lives of these two men, the disease became of sufficient importance to attract the attention of the sages of that age. From that time, nearly four centuries before Christ, down to the present day, the infection has been indigenous to the soil of Greece.

It was not until the Roman Empire was at its height, following the conquest of foreign lands, that the disease was introduced into Italy, but from there it spread over all Europe. It was present throughout Spain and France when the Moors swept up from the south and it had become a common and familiar affliction in England even before the Norman conquest. During the Middle Ages no country of Europe escaped the disease. With plague and smallpox it constituted the most fearful scourge of mediæval times, until rulers and clergy becoming alarmed at its rapid extension and terrible ravages, instituted measures for its control. The repressive measures

of that day, while not altogether based on humane principles, recognized that the disease was communicable and called for the segregation and isolation of those afflicted. So widely disseminated was the infection that every considerable town had its institution or hospital in which the victims were segregated. In England the first of these was erected at Canterbury in 1096, and throughout Europe there was probably a total of at least 20,000 leprosaria of this character. Wherever such means were adopted for its control a marked reduction in the incidence of the disease ensued, until finally only the records of earlier days remained to tell the story of its ravages. There still linger in Norway and along the shores of the Baltic, however, foci of infection dating presumably from that time, although these are being rapidly extinguished through compulsory segregation. For a hundred years the disease has been nonexistent in England, outside of the relatively few cases developing on foreign soil, and Germany, France, and to a certain extent Spain, have been equally successful in eradicating the last traces of the infection.

It is uncertain when leprosy invaded the Western Hemisphere. Possibly it was brought by the early Spaniards, or it may have been introduced from Africa in the days of the slave trade; at any rate there is no mention of the disease in the early historical writings. At present, however, it occurs sporadically in many sections. Mexico, Brazil, Colombia, Venezuela, Chile, and Peru all report cases. Countries with such contrasted climatic conditions as Iceland and the Hawaiian Islands have been visited and in each instance the disease has spread. Though the infection probably reached the islands of the Hawaiian group about 1848, opinion seems to differ somewhat. In 1865 approximately 1 of every 300 of the native inhabitants was affected; by 1891 this proportion had increased to 1 in 30, since which time, following the institution of repressive measures, a rapid diminution in the number of cases has been observed.

At present, with the exception of the areas mentioned, the disease is practically world-wide. It is common enough in the Philippines, Japan, the Malay Peninsula, China, India, and Africa, and the residents of no climate are exempt. It has greatly increased in South Africa, and has attacked Europeans as well as natives. In Australia it was introduced by the Chinese, but has in no respect confined its ravages to that class. It is safe to say that no particular portion of any population possesses immunity, and there is none in whom the disease may not occur. Whether they live on mountain or plain, at the coast, or in the interior, matters little; once the infection has been introduced it usually spreads. While the degree of communicability may not be as great as was formerly supposed, and the length of exposure must probably be long continued, there is not the slightest reason to doubt that every case must arise from a preexisting case. The truth of this statement is borne out by the fact that wherever segregation and isolation have been practiced a decided reduction in the number of cases has been the result.

Jos. E. Ransdell, *Chairman.*

CARE AND TREATMENT OF PERSONS AFFLICTED WITH LEPROSY.

TUESDAY, FEBRUARY 15, 1916.

UNITED STATES SENATE,
COMMITTEE ON PUBLIC HEALTH AND
NATIONAL QUARANTINE,
Washington, D. C.

The committee met in Room 349, Senate Office Building, at 10 o'clock a. m., pursuant to call, Senator Joseph E. Ransdell presiding.

Present: Senators Ransdell (chairman), Fletcher, Beckham, Smoot, Works, and Weeks.

The CHAIRMAN. We are convened this morning to hear testimony on the bill (S. 4086) to provide for the care and treatment of persons afflicted with leprosy and to prevent the spread of leprosy in the United States.

The clerk will cause the bill and the report of the Secretary of the Treasury to be inserted in the record.

[S. 4086, Sixty-fourth Congress, first session.]

A BILL To provide for the care and treatment of persons afflicted with leprosy and to prevent the spread of leprosy in the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of carrying out the provisions of this act the Secretary of the Treasury is authorized to select and obtain, by purchase or otherwise, a site suitable for the establishment of a home for the care and treatment of persons afflicted with leprosy, to be administered by the United States Public Health Service; and either the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, or the Secretary of Agriculture is authorized to transfer to the Secretary of the Treasury any abandoned military, naval, or other reservation suitable for the purpose, or as much thereof as may be necessary, with all buildings and improvements thereon, to be used for the purpose of said home or homes.

SEC. 2. That there shall be received into said home, under regulations prepared by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, any person afflicted with leprosy who presents himself or herself for care, detention, and treatment, or who may be apprehended under authority of the United States quarantine acts, or any person afflicted with leprosy duly consigned to said home by the proper health authorities of any State, Territory, or the District of Columbia. The Surgeon General of the Public Health Service is authorized, upon request of said authorities, to send for any person afflicted with leprosy within their respective jurisdictions, and to convey said person to such home for detention and treatment, and when the transportation of any such person is undertaken for the protection of the public health, the expense of such removal shall be paid from funds set aside for the maintenance of said home or homes.

SEC. 3. That regulations shall be prepared by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, for the government and administration of said home and for the apprehension, detention, treatment, and release of all persons who are inmates thereof.

SEC. 4. That the Secretary of the Treasury be, and he is hereby, authorized to cause the erection upon such site of suitable and necessary buildings for the purposes of this act at a cost not to exceed the sum herein appropriated for such purposes.

SEC. 5. That when any commissioned or other officer of the Public Health Service is detailed for duty at the home herein provided for, he shall receive, in addition to the pay and allowances of his grade, one-quarter of the pay of said grade.

SEC. 6. That for the purpose of carrying out the provisions of this act there is hereby appropriated, from any money in the Treasury not otherwise appropriated, the sum of $250,000, or as much thereof as may be necessary, for the preparation of said home, including the erection of necessary buildings, the maintenance of the patients, pay and maintenance of necessary officers and employees, until June thirtieth, nineteen hundred and seventeen.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, January 8, 1916.

HON. JOSEPH E. RANSDELL,
Chairman Committee on Public Health and National Quarantine,
United States Senate, Washington, D. C.

MY DEAR SIR: Referring to your communication of February 2, 1916, requesting the views of this department on Senate bill 4086, providing for the establishment of a national leprosarium for the care of lepers, I have the honor to state that the bill has the hearty approval of the department, the necessity for legislation of this character having been apparent for many years.

But 2 or 3 of the 18 States in which leprosy prevails have been able to make proper provision for the care and segregation of those afflicted. Even where this has been done, the expense of providing custodians and nurses for individual cases has been considerable. Therefore, for economic reasons alone some measure should be devised for the custodial care of those who are ill of the disease. Considered from a humanitarian standpoint, there is all the more necessity for such a provision. The contagious and loathsome character of leprosy is such as to excite great abhorrence on the part of the general public, and wherever lepers are recognized as such they are immediately ostracised, and in certain instances have been driven from place to place. The Public Health Service is frequently called upon in instances of this character, where interstate migration has occurred, to provide care and treatment, and even in cases which do not come within the jurisdiction of that organization the Public Health Service is appealed to for assistance. For humanitarian and economic reasons alone, then, it is believed that the bill should receive indorsement.

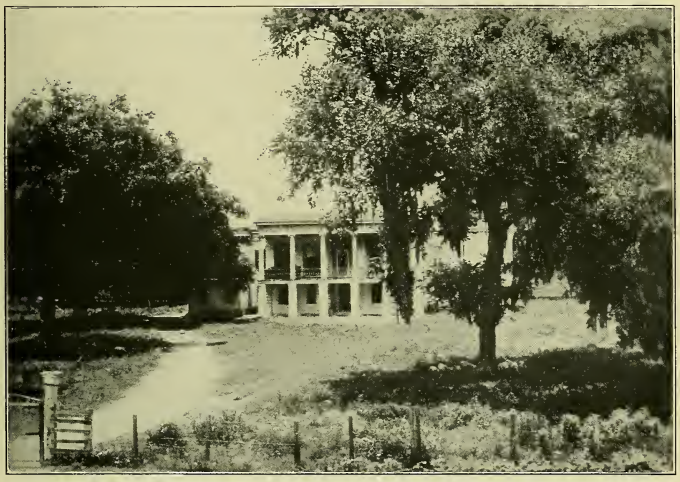
The establishment of a leprosarium in order to prevent the further dissemination of leprosy in the United States is, without doubt, a measure of value, so that the contemplated enactment has a threefold purpose—economy, humanitarianism, and the protection of the public health.

In section 5 of the bill it is proposed that when officers of the Public Health Service are detailed for duty at the leprosarium mentioned they shall receive, in addition to the pay and allowances of their grade, one-half the pay of said grade and such allowances as may be provided by the Surgeon General, with the approval of the Secretary of the Treasury. Allowances of this character have already been sanctioned by Congress to officers of the Public Health Service detailed for duty at the leprosarium at Molokai, Hawaii, and it is believed to be no more than just, in view of the dangers and necessary isolation to which they are subjected, that the additional compensation should be allowed.

Respectfully,

W. G. MCADOO, *Secretary.*

The CHAIRMAN. The committee will first hear from Dr. Dyer.



MAIN ADMINISTRATION BUILDING AND NURSES' HOME, LOUISIANA LEPER HOME, CARVILLE, LA.

STATEMENT OF DR. ISADOR DYER, DEAN OF TULANE SCHOOL OF MEDICINE.

The CHAIRMAN. Will you please state your position in New Orleans—your medical position? You are dean of the Tulane School of Medicine, are you not, Doctor?

Dr. DYER. Yes, sir.

The CHAIRMAN. And have been for many years connected with work in regard to leprosy in New Orleans?

Dr. DYER. Yes sir; since 1894.

The CHAIRMAN. Doctor, we would be very glad if you would tell us, in a general way and in your own manner, what you know about leprosy, its origin, and the remedies that may be applied to it, and in your opinion, what need there is for a national leprosarium, starting with the experience you have had with the disease.

Dr. DYER. I think the last part of the arguments, sir, would perhaps be briefer than the first.

The CHAIRMAN. Just handle it in your own way, Doctor.

Dr. DYER. A discussion of the origin and treatment of leprosy covers a great many centuries, and while it would be interesting, I believe it would take up too much of your time to go into that.

I believe we would be concerned most in the status of leprosy in the United States, as bearing upon the proposition to-day; and I would say, generally, that we have to look at it from two or three points of view.

The first is that leprosy has been in the United States for over 200 years, and probably at more than one point.

The second is that leprosy has been introduced into the United States continuously since the first evidence we have, which was in the last part of the eighteenth century, and that during recent years more and more cases have come in, particularly since the close intercommunication with the Islands of the Caribbean and the Pacific Ocean. In other words, the new extraterritorial possessions of the United States have contributed considerably to the existence of leprosy in the United States. Lack of insistent isolation of lepers, as practiced in some other countries—I do not mean the absence of laws, but the lack of insistence upon local quarantine against leprosy—has resulted, in the United States, in a great many more foci of leprosy than there were a few years ago.

The CHAIRMAN. Will you tell us how many of these foci there are in the United States?

Dr. DYER. I will get to that point rather deliberately, Mr. Chairman, if you will allow me.

The CHAIRMAN. Very well.

Dr. DYER. We know that in Louisiana and along the Gulf coast leprosy has existed since the latter part of the eighteenth century. The popular impression for many years was that leprosy in Louisiana came with the Acadians from Nova Scotia, and that impression was due, no doubt, to the fact that among the descendants of these people leprosy has existed, but the evidence seems to point to the fact that the disease came rather through the West Indies, par-

ticularly Martinique, where it has been known to exist, and Cuba, where we know it existed in Havana.

In Florida, especially at Key West, the disease has existed for a number of years, and it has also existed in various coast towns in Mississippi, where leprosy is now found.

A rather interesting experience has been in Texas, where the disease has grown and extended from a small but steadily radiating center in Galveston to other cities. Leprosy in Texas is now found in Galveston, San Antonio, Eagle Pass, Laredo, Fort Worth, and probably in other places. The total number of known cases there is now, I think, 26.

The CHAIRMAN. In the whole State of Texas?

Dr. DYER. In the whole State of Texas, yes. Leprosy has been cared for in California for many years. Their legislation on the subject goes back to 1890.

Cases are reported from Oregon and from Minnesota, where the disease was introduced for the purpose of determining whether migration would help its cure.

Senator WORKS. Do you know how many cases are reported in California?

Dr. DYER. The last report I saw stated there were 26 or more—less than 30; 26, I think.

Senator WORKS. How many cases are there in the United States?

Dr. DYER. That is a very hard question to answer. I can only answer that question by suggesting that the actual number of cases would have to be ascertained by multiplying by two or three times the number of known cases.

Senator WORKS. Does our census enumerate the number of cases discovered?

Dr. DYER. The last report was made by our Public Health Service and was necessarily inadequate, as it was based upon direct returns from State and local health authorities.

Senator WORKS. How many were reported in that report?

Dr. DYER. I think the first report had 278, and the second report had about 170.

Senator WORKS. Of that 170 or 278, as the case may be, whatever the number is, of cases in the United States, can you give any idea as to how many could have been excluded from the United States if the immigration laws had been strictly enforced?

Dr. DYER. I think comparatively few.

Senator WORKS. You believe that the greater number of cases have been developed in this country itself?

Dr. DYER. I can answer the question almost categorically by saying that of the 278 reported the majority were reported from Louisiana, and of them there was only one foreigner.

Senator WORKS. You believe that there is a majority of that number reported from one State?

Dr. DYER. Yes, sir; that is the reason why I say the report was inadequate.

Senator WORKS. Do you think there are 278 cases in Louisiana?

Dr. DYER. There are 105 in the leper home there now, and the actual number of cases ought to be determined by multiplying that number by 3.

Senator WORKS. How is your institution maintained—by taxation?

Dr. DYER. Our institution is maintained by the State, through taxation. I do not mean through any special tax fund, but through the general taxation.

The CHAIRMAN. Have you any system of requiring the patients to pay?

Dr. DYER. No.

The CHAIRMAN. You have a large charitable hospital in New Orleans where people do receive free treatment, have you not?

Dr. DYER. Yes, sir.

The CHAIRMAN. It might be that people could get in there and then be transferred to this leper institution, might it not?

Dr. DYER. That really does not occur, because each case of suspected leprosy is thoroughly investigated. The procedure is that in case a leper is reported the case is turned over to my service for examination. A report is then made to the board of health, which follows the law in segregating lepers.

As illustrative of the inspection of a suspected leper, I would like to insert in the record an article by Dr. Ralph Hopkins and myself.

(The article by Dr. Hopkins referred to is here printed in full, as follows:)

THE DIAGNOSIS OF LEPROSY.[1]

By ISADORE DYER, Ph. B., M. D., professor on diseases of the skin, medical department, Tulane University, of Louisiana; consulting leprologist to the Louisiana Leper Home, etc., and RALPH HOPKINS, M. D., lecturer on diseases of the skin, medical department, Tulane University, of Louisiana; visiting physician to the Louisiana Leper Home, New Orleans.

Long association with the Louisiana Leper Home has given us an opportunity for the observation of leprosy, and we hope that this, together with the importance of correct and early diagnosis, in countries where leprosy is likely to occur, will justify the present discussion of this subject. We are not submitting any new points in diagnosis, but rather argue the need of a practical presentation of the matter for the general profession, especially in our own country, where every now and then a notable case proves an ignorance of essential points which should be known. More than this, the reports of imported cases of leprosy in our seaport cities have shown conclusively either that the national quarantine against leprosy is a farce in its enforcement, or that the quarantine officials are ignorant of the symptoms of the disease. In New York chiefly numerous cases have been presented which have more or less recently been admitted to this country without hindrance.

As a matter of fact, the increasing number of lepers in New York has grown by importation, as the disease so far is not held endemic there.

The trouble in diagnosis lies more with atypical cases, with incipient tubercular cases, and with those anesthetic cases which present no longer active skin manifestations. Another source of confusion in diagnosis lies in the changes that appear in lesions during the periodic occurrence of exacerbations accompanied by lepra fever.

Like syphilis, leprosy has often been divided into stages and types, but, as in syphilis, the value of such diagrammatic classification of leprosy is greatly impaired by the fact that the types are often mixed and that the lesions that should be present in one stage are often found in another. Generally the type depends on the habitat of the bacillary cause, the anesthetic or trophic being due to nervous injury by the bacilli, the tubercular or nodular being due to the presence of the bacilli in the skin, and the mixed type being a combination of the anesthetic and tubercular forms. It is not unusual in the course of years to see a change in the type. The tubercular type in a mixed case may disappear, leaving only the anesthetic, and a purely anesthetic case may after years develop tubercles, forming the mixed type, which may in turn evolve a trophic type, having no tubercles in evidence.

[1] Read in the section on dermatology of the American Medical Association, at the sixty-first annual session, held at St. Louis, June, 1910.

The usual sequence of the lesions after the prodromal period is that the first manifestation in almost every case is in macules, which usually initiate all types usually varying in their location accodingly. Much rarer is the bullous eruption which occurs in this same early stage. Tubercles usually appear later than macules and may be independent of them; the ulceration and cicatrization of the skin occur ordinarily only in the terminal stage, though the perforating ulcer, which is a sinus leading to necrotic bone, may be found early, and in mutilating types the erosions following bullous leprosy may form true ulcers before any macules or tubercles present themselves.

The macular eruptions do not always present the same characteristics. They vary from the size of a dollar, or smaller, to a patch large enough to cover an entire anatomic region; the pigment may be almost uniformly distributed throughout the patch, as it is in chloasma, or it may disappear in the center, leaving a ring of pigment surrounding an area of skin lighter in color than the normal; somewhat the same arrangement that ringworm of the general surface assumes, except that the atrophy of pigment in the center is marked and may, at the same time, involve the deeper skin. Scales are unusual in both types and occur usually only as a result of inflammation in the area or as the evidence of trophic disturbances.

The first type, the uniformly pigmented macule, depends largely for its characteristics on the amount of infiltration provided by the presence of the bacilli. It may be simply a brown stain, level with the surface of the skin, with an irregularly shaped border not always marginated, or a patch so elevated that the term macule becomes a misnomer. On the other hand, there may be multitudinous macules, with symmetrically bilateral distribution on the trunk and extremities alike, entirely free of bacilli and having all the characteristics of a true erythema.

This form of macule is particularly common in anesthetic leprosy in which the early involvement of the nerve trunks of the extremities points to the toxic influence of the leprous deposits along the nerves. This is particularly argued in the facts that such eruptions of macules are evanescent and that the lesions themselves are highly colored, bright red, and are often apt to be hyperesthetic and not anesthetic as are the more deeply pigmented and infiltrated lesions.

In the second form the margin is well defined, and the brown color becomes a purplish red. Between these two extremes are the variations in shade made possible by the varying degrees of inflammatory infiltration. The favorite location is the buttocks, though the face, trunk, and limbs may also be involved, and these macules are often the sites of later tubercles or nodules, especially when found on the face. Though these may not be necessarily symmetrical when they first appear, later these macules become so as the eruption fully develops. During the periods of lepra fever the macules may become intensely inflamed and painful, and though the fever does not usually occur severely during the incipient period, we have had at the Louisiana Leper Home instances in which the whole macular areas, numbering four or five as large as the palm of a child's hand, have ulcerated. Ulceration in the incipient stage is indeed rare and can be explained only by the lepra fever, which is evidently a manifestation in greater or less degree of fulmination of deposits of lepra organism, or else the acute reaction associated with new fields of invasion.

In the circinate type the patch of lepra macules usually grows in size after it first appears, spreading from the outer border of the ring, which preserves a well-defined margin; and it is more often associated with the anesthetic than the tubercular form. The inner margin of the ring is not liable to show as well-defined a border as the outer, and as the lesion grows larger in area the paler center grows also, keeping the pigmented ring nearly constant in relative breadth. The degree of infiltration in this type of macule is not as variable as in the first type, usually remaining slight, and the color varies with the depth of infiltration. This, too, is found almost always as a light brown, aptly described as a café au lait, which is the characteristic color of all of the macules that present the least amount of infiltration. A reddish tinge is added to the brown of the border in those cases with more marked infiltration, the resultant color being a red-brown, which is again intensified during the lepra fever. This circinate type may occur on any part of the body, but the hands and head are not as liable to this as to the form in which the macule presents a uniformly pigmented area, appearing en plaque. The areas of especial predilection are the shoulders, legs, thighs, buttocks, and forearms, in the order named. It is not infrequent to find confluent lesions of this type forming grotesque ribbons of

irregular borders and outlines extending along the whole of an extremity or showing symmetric figures over the back.

The bullous eruption, which is very rarely seen, occurs associated with this early stage, or precedes the macule if it occurs at all. The bullæ contain serum at first, but become pustular in a short time. They are not larger than a small marble, and occur most frequently on the hands and feet. The clinical diagnosis is frequently difficult without other evidences of the disease. The bullæ have a predilection for the areas over the knuckles of the fingers and will repeatedly appear in the same site, establishing scar areas with encircling pigment, which is characteristic. Often these lesions lead to ulceration and even trophic changes in many cases misleading to a diagnosis of neuritis and not infrequently escaping the suspicion of leprosy for months or years, in the hands of neurologists. Several cases have finally come to a diagnosis of leprosy when the skin evidences of macules or tubercles elsewhere have developed.

On the feet the bullæ seldom appear so early, and when they do come they are found on the plantar surface, usually going on to actual ulceration, trophic in character.

Late leprosy will develop bullæ as evidences of trophic changes, and here the destruction of skin and deeper tissues is the rule, finally causing the destructive, amputative deformities found in nerve leprosy and the loss of terminal or intermediate phalanges of the digits of fingers and toes.

The tubercles in leprosy have their favorite location on the face, involving especially the lower part of the forehead, the ears, the nose, the chin, the cheeks in the order named. The hands and other parts are less frequently involved.

They may begin in the patches of a macular eruption or they may develop in normal skin. When sufficiently developed tubercular or nodular leprosy is essentially a bilateral, symmetrical disease. In some cases individual tubercles can not be distinguished, but the whole skin of the face is greatly infiltrated, thickened, and discolored, the surface remaining smooth or more often cut by furrows sometimes a quarter of an inch deep in the natural lines of cleavage or in the folds of the forehead, cheeks, or chin. This furrowed type is especially marked on the cheeks and forehead and gives the leonine expression to the countenance more strikingly than the other varieties. In other cases the tubercles preserve their integrity, studding the face in their favorite areas of distribution with nodules varying in size from a pea to a marble. The color is usually a dusky reddish-brown or may be waxy white in those cases in which the lesions are scattered and which are usually the most malignant. Each individual nodule is rounded at the base and spherical in contour, much as if peas or marbles had been stuck in the skin.

The eyebrows and beard may fall in this type, but as the scalp is not usually affected its hair may be preserved in its integrity until very late in the disease or to its termination.

Periodically in the course of the disease there may occur an outbreak of tubercles, evanescent in character, highly inflammatory, and very painful. These occur during the course of the lepra fever before mentioned, which may last from one to five or six weeks, or even longer. These tubercles are deep-seated and dull red in color, not showing the brown pigment of the chronic type. They fade away with the subsidence of the fever and sometimes one crop will disappear to be replaced by another before the temperature returns to normal. The inflammation in this type is sometimes so intense that vesicles and bullæ develop on the tops of the tubercles, and some may even undergo suppuration with the formation of abscesses. Their distribution over the body is far more general than that of the permanent tubercles, as they occur not only on the face and hands but also on the trunk and on both the flexor and extensor surfaces of the extremities. The type of fever referred to as lepra fever is not the fever usually described as one of the prodromal symptoms of leprosy, but is an irregular elevation of temperature ranging from 100° to 104° F. and associated either with marked changes in the macules or tubercles present before the occurrence of the fever or with the formation of such tubercles as have just been described. These tubercles may be especially recognized by their tendency to uniformity in size and their usual lenticular shape as if a flat bean were embedded in the skin.

The lepra fever has two distinguishing symptoms, the rise in temperature and the development of tubercles different in many characteristics from the lesions found as the usual evidences of leprosy. In the tubercular and mixed cases it occurs at varying intervals of time and is of varying duration, while

in the pure anesthetic and trophic cases, as there are no tubercles, the skin evidences are lacking. Though there may be periodic rises of temperature, they are often associated with the suppuration which is the result of nerve disturbances and which is more liable to affect the bones and joints than the skin. In consequence the cardinal point in the diagnosis of lepra fever is lacking.

The inflammatory evidences in the tubercles accompanied by a general rise of temperature occur in almost every case of tubercular or mixed leprosy, though the symptoms are sometimes of so slight a character as almost to escape observation. The temperature may vary from so slight a rise above the normal as to occasion merely a feeling of malaise to a grave febrile condition. The range of temperature is from 99° to 105° or 106°, and two cases have been observed in which the result was fatal. The attack is often ushered in with a chill and the duration is very variable—from a few days to several weeks or even months. Some patients have been known to have as many as three or four attacks during one year. The chief features of the temperature chart are the remittent character of the fever and the sudden great rises and fall of temperature. The chart of a well-marked case very closely resembles that of septicemia.

The occurrence of marked inflammatory symptoms in old tubercles, infiltrated patches, macules, or in areas of skin which apparently were previously healthy, is coincident with the rise of temperature and is characterized by swelling, redness, pain, and, rarely, suppuration. The occurrence is most frequent in old tubercles and least frequent in areas of skin which previously were not involved. The duration of the inflammatory nodules is short, but one crop is followed by another as long as the fever lasts. The location is most frequently on those parts of the body that are involved by the chronic characteristic nodules of leprosy, the face, neck, hands, and also the arms and legs. The distribution seems, like that of the chronic lesions, to prefer those parts of the body in which the temperature is lowest. The trunk is less frequently involved, and we have seen no cases involving the scalp. The number of lesions found at one time is very variable and they are disseminated with an irregular, bilateral symmetry. They vary from the size of a split pea to that of a hen's egg. The elevation above the surrounding skin is well marked and the nodules are of a globular contour, usually rounded in outline and distinctly limited in area. The color is uniformly red—a brighter and more brilliant hue than the dusky purplish red of the stationary tubercles, from which they can be differentiated not only by their inflammatory character but also by their rapid development, their evanescent character and an occasional tendency to suppurate and occur on parts of the body not usually affected by permanent bacillary deposits. Unless suppuration occurs the nodules are quite firm to touch and most resemble those found in erythema nodosum. It has been a matter of observation that often after attacks of lepra fever there has been improvement in the old tubercle and in the general condition, which seems to argue that during these attacks some bacillary product is formed which not only causes the elevation of temperature but also either directly affects the life or growth of the organisms, or indirectly, through the elevation of temperature, produces a condition unfavorable to the germ life.

In support of the latter view may be mentioned an observation made by Dr. F. B. Gurd, of the department of pathology of Tulane, in which the pus from an abscess caused by the suppuration of an inflamed tubercle was found to contain no organism except the bacillus of Hansen. These bacilli were found to be incapable of cultivation under the same conditions in which other Hansen bacilli had been found to flourish.

It is also interesting to note that during the administration of a series of hot baths, in which an effort was made to maintain an elevation of temperature of 104° for several hours, two tubercular cases developed lepra fever. If we may be permitted a little speculation, the great improvement derived from elevation of temperature, even in advanced cases of leprosy, may be explained on the hypothesis that the lepra bacillus does not thrive at high temperatures. The location of the chronic tubercles is very suggestive of this, as is also the improvement noted after erysipelas, lepra fever, and artificial elevation of temperature by means of hot baths. It seems possible that the products of the disintegration of dead bacilli provoke a general rise of temperature as well as the local heat of inflammation, and that the febrile condition thus produced reacts on bacilli in other locations, which, in turn, in their disintegration, liberate fever-producing toxins. It is conceivable that such a process should continue

until all the less viable bacilli become destroyed, when the temperature returns to normal and old lesions show considerable improvement.

With the exception of the tubercle associated with the lepra fever the nodules of leprosy seem to have a marked preference for the exposed parts of the head. The scalp is almost always free, while the ears are, on the contrary, almost always involved. They become enormously enlarged either by the presence of tubercles, in the lobes especially, or by a diffuse infiltration, both of which cause a marked discoloration. It is not unusual to find, even in terminal cases, tubercles present massed over the entire face and ulcerating, the limit of the most aggravated part of the eruption clearly marked by a line around the neck about where the shirt-band rests. On the trunk and arms and legs the macular eruption is far more common than the tubercular, though nodules may occasionally be found over a macular patch or even on a part of the skin presenting no other lesions. The tubercles never mass over the entire body as they do over the face. The most common condition on the hands is the thickening of the skin and pigmentation, with tubercles more sparsely scattered than on the face, the color being a dusky brown. The infiltration and swelling of the hands so affect the skin as often to cause a papery consistency like thin parchment.

The ulcers of leprosy are of two kinds, the perforating and the purely cutaneous. The latter occur most frequently on the face and on the legs. On the face they are usually superficial, but those around the mouth are liable to cause considerable destruction; and when the ulceration has healed the shrinking resulting from cicatrization will reduce the mouth to about one-third its normal size. The ulceration of the face occurs only in the terminal stage, when the tubercles have become large and thickly aggregated, and it is found only in the tubercular and mixed types, the trophic form, or nerve leprosy, showing in the face only by the infiltration of the whole mask of the face, with thinning of the epidermis, leaving the skin glossy and pigmented. The ears in this form are often flabby and pendulous; ectropion causes a stare, which is a peculiarity of this disease. The cause of the breaking down of the nodular masses seems to be due more to a disturbance of circulation in the skin than to the bacilli present, and this seems true also of the ulcers of the leg, where the circulatory balance is easily disturbed by gravity.

The perforating ulcer is associated only with the anesthetic form and is found only on the hands and feet, and more often on the ball of the foot than elsewhere. It is a surgical condition, being a sinus leading to necrotic bone. The horny layer of the skin is much hypertrophied when the ulcer is on the foot, and the condition is painless.

A strong confirmatory symptom of leprosy is the anesthesia found in all types. In the tubercular type it is confined to the lesions, but in the anesthetic it spreads over the area of distribution of the nerve affected. The sense of pain and temperature are lost before the sense of touch, and in the anesthetic type the nerves most frequently involved first are the ulnars. The loss of sensibility begins usually in the tip of the little finger and spreads gradually to the adjacent fingers and up to the forearm. Other nerves become involved later on and the anesthesia may become general. In this instance there is always either marked thickening of the ulnar nerve or distinct nodes along the nerve. The left side is more often the first to be affected.

The mutilation in the anesthetic or nerve type is almost confined to the hands and feet, usually being limited to a loss of the fingers and toes, and is due to trophic changes caused by nerve destruction. The atrophy may be manifested by the "claw hand," in which the flexor tendons and muscles shrink more than the extensor, drawing the fingers up and preventing extension, or it may affect the bones, causing either necrosis or a gradual degeneration and absorption.

When necrosis occurs a perforating ulcer is established and persists until the fragment of dead bone, sometimes an entire phalanx, is discharged. The ulcer then heals, leaving the finger or toe shortened by the loss of bone. When necrosis with suppuration does not cause the loss of bone in mass a slower process of absorption goes on, and the flexed fingers become shrunken masses of flesh with atrophied nails at their extremities.

The curious condition of an amputation at the joints by constricting circular atrophy, just as in the disease known as "ainhum," is often observed, and fingers and toes are often lost in this painless way. A band of fibrous tissue forms around some part of the digit and gradually constricts the underlying tissues. The band is usually about one-quarter to one-half inch in breadth, and as it grows tighter the tendons and bones under it atrophy until the finger is left hanging by a fibrous band, which can easily be cut off with a pair of scissors;

or if left to itself, the finger will fall away, the patient often being unconscious when the loss occurs.

The suppuration attending the necrosis of bone may extend to joints involving the articulations at the wrists and ankles and occasioning a condition like tuberculous or septic arthritis.

Considerable attention has been directed to leprosy in the United States, and recent cases have enforced the belief that not enough emphasis has been placed on the training of Government physicians with regard to this disease. The notoriety attaching to the Early case alone, which excited the qualified criticism of at least two distinguished foreign leprologists, may be cited in point.

The United States has specific immigration laws which require the deportation of lepers; yet in 1908 several patients with advanced leprosy were shown in New York at the international dermatological congress, and some of these cases were in recently imported foreigners.

Within the past three years Dr. Dyer has seen two lepers from Central and South America who reached New Orleans by way of New York. These cases were well enough marked to have been recognized by any health officer who had even a meager idea of the disease.

It is highly important that the cardinal symptoms of leprosy should be learned by the officers of the public health, so that importation of leprosy may stop. It does not require any more legislation, but more education of port physicians.

The salient points of diagnosis in leprosy consist in the recognition of the stamp of the disease, which is always suggested by the dusky hue, the swollen skin, the overhanging eyebrows, and the raucous voice. The hands, too, have a thinned epidermis and an altered color which is different from that in any other disease. The presence of tubercles in the skin of the face, at the lips and about the nose, with others in the pendulous parts of the ears—all these should make a case suspicious.

The differential diagnosis of leprosy clinically is at all times simple. There are only two conditions which at all resemble tubercular leprosy, iodism and disseminated tuberculosis cutis. The first-named condition is seldom seen in the areas common to leprosy and the nodules of iodism are highly inflammatory and ready to break down.

With tuberculosis of the skin the lesions are numerous, small, and deep-seated, under the epidermis as a rule. They are dirty white in color and seldom assume a reddened hue. Moreover, this condition on the face is unusual, and when it does occur the lesions are more apt to occur bilaterally and symmetrically in numbers on the cheeks and wings of the nose than elsewhere.

We would finally make the point that all physicians should report any cases of leprosy coming under their observation, so that the actual occurrence of this disease in the United States may be studied and the statistics derived may be of some value in establishing an institution for the care of leprosy under Government control and expense.

Senator Works. How many of the people afflicted with leprosy in Louisiana are foreign born?

Dr. Dyer. Comparatively few. Nearly all are native born. Those given as foreign born in the statistics from which we have drawn have lived in Louisiana from 10 to 30 years.

Senator Works. Where do you think that disease came from?

Dr. Dyer. It was contracted in the State, so far as the most of us believe; it has never been proven to be hereditary, and the evidence points to direct contagion. The disease is apparently contracted as tuberculosis is.

Senator Works. You think it is a contagious disease?

Dr. Dyer. Yes, sir; I do.

Senator Smoot. It has been a long time ago, but I have slept in houses where there were lepers. It is true, I had my own towel and my own calabashes and slept in my own sleeping bag. I have slept in houses where there were lepers who had their faces all drawn out of shape and their arms twisted out of shape in all conceivable ways. I have been on the leper island time and time again. I have visited

there and seen just how they live. I knew the doctor in charge of them. I am speaking now of Molokai, Hawaiian Islands.

Dr. DYER. Yes.

Senator SMOOT. If that disease is contagious, I think I ought to have it.

Senator WORKS. Are you able to trace this disease back to incoming immigrants?

Dr. DYER. In Louisiana we of course have not, because the early history of the disease is probably too far back for us to derive facts on this point. What we have been able to do has been to study a group of cases coming from one or another section of Louisiana. We have undertaken in Louisiana to find the foci of the disease. There are at least two in New Orleans and three in the State. The chronological history of leprosy in Louisiana has shown that the disease has gradually spread until there are 32 out of 59 parishes in the State involved. The whole history of the Galveston cases may be traced to St. James Parish in Louisiana. That would show that the disease is contagious.

Senator SMOOT. How do you account for cases such as mine, for instance, where no results have appeared as the result of sleeping in the same house with lepers?

Dr. DYER. I think the probable explanation of that would be that people have escaped infection from lepers just the same as they have lived in the same house with people who have tuberculous and did not contract that disease; but they are certainly taking chances, as you probably did yourself. Leprosy is very much less contagious than most diseases.

Senator SMOOT. My case is similar to thousands of others.

Dr. DYER. That is the experience of attendants at the leper home. It is probably because they are careful. It does not prove that the disease is not contagious. The disease is certainly contagious, and these cases where people do not take it from lepers are susceptible of no other explanation, it seems to me, than the one I have given.

Senator SMOOT. I do not want you to think that I did not believe that it could be transmitted.

Dr. DYER. No.

Senator SMOOT. I think, however, that the only way it can be transmitted is to come into contact with a towel, for instance, which has been used by a leper, or drinking out of a vessel or cup that has been used by a leper, or coming in contact with any kind of clothing worn by lepers, which has come in close contact with the person's body.

Dr. DYER. We have had two clear cases where the disease has been contracted by living in a house which had been vacated several years before and occupied again without disinfection. In Louisiana we also have a case where a child has contracted the disease and after several years the father and mother developed it.

Opinion is divided as to the contagiousness of leprosy, but I think that men who have lived among colonies of lepers are all of the opinion that the disease is contagious; and the experimentation that has been made with the lower animals rather points to that fact. The disease has been produced by inoculation in monkeys and white rats, and even in cold-blooded animals, such as fish, and the disease has

grown. Experimentation with human subjects has been entirely too ancient and too uncertain to place any reliance upon as proof.

Senator Works. Just what provision has been made for caring for these afflicted people in your State?

Dr. Dyer. The State enacted a law in 1894 providing for a board of control which was authorized to create and take care of a home for lepers, and an initial sum of $10,000 a year was appropriated to take care of this institution. A ground lease was taken on property about 60 miles above New Orleans, on the Mississippi River, and at first the old cabins on the plantation were used for the lepers, of whom originally there were 10 transferred from the pesthouse in New Orleans. The accommodations have gradually improved until now the old cabins have all been destroyed and the institution is on the pavilion system. The males and females have been segregated in different parts of the camp, the more advanced being separated from those of milder types. The houses are all modern cottages; each cottage will care for anywhere from 6 to 20 patients, with usually not more than 2 patients to a room. The cottages are provided with all modern conveniences for bathing—hot and cold water—and all sanitary arrangements. The houses are all thoroughly screened. There is a central dining room, and the colony has also a chapel for services and a place for exercise. When the home was started it was rather difficult to get proper nursing; so the Sisters of Charity of the order of St. Vincent de Paul were asked to take charge, and they have done very efficient work.

Senator Works. What has been your experience in your effort to induce people to take treatment there and live there?

Dr. Dyer. I shall have to make a division of your question in order to answer it properly.

The home has been exceedingly satisfactory from the standpoint of voluntary admissions. I should say that 80 per cent of the patients who have gone to the Louisiana home have gone voluntarily. At first it had the fearfulness of any such a place and it was looked upon as an asylum, and not a hospital; but gradually that prejudice has been overcome.

The law provides for leprosy as it does for any other contagious disease. The disease must be reported just the same as any other contagious disease; there is a penalty for harboring a leper, and they get no treatment outside, if it is known to the authorities. When the purposes and conveniences of the home are described to them, and contrasted with their surroundings at home, where they are necessarily concealed, the cleanliness and comforts of the leper home contrasted with the dirt generally and the inconveniences of their poor surroundings, there is little difficulty in persuading them to go to the home. We explain to them that there is a certain degree of freedom at this home, and we do not keep them in confinement. No asylum should be conducted on those lines. We have practically abandoned the idea of compulsory isolation. Sometimes they have refused to go, but those cases would not amount to probably more than 20 per cent of the admissions.

Senator Works. Do patients who are able to pay bear part of the expense?

Dr. Dyer. No, sir; they are not taxed at all.

Senator Works. How far is the colony from a city?

Dr. DYER. It is about 30 miles from Baton Rouge.

Senator WORKS. That is the closest city?

Dr. DYER. There is a small town on the other side of the river—Whitecastle, La., which has about 2,500 people—and then there is another small settlement which is about 3½ miles from it.

Senator SMOOT. Do you think that mosquitoes and flies can convey the disease?

Dr. DYER. That is another question. In the Sandwich Islands they have found the bacilli of leprosy in the mosquito, and some experimental work has been done in the University of Pennsylvania with the bedbug, where the bacilli of leprosy have been cultivated through the bedbug. However, any opinion as to that would have to be a hypothesis. It is very hard to argue that. We do not know the source of contagion. The general opinion seems to be that it spreads very much as tuberculosis does—through inhalation through the nose and mouth.

Senator SMOOT. Perhaps the only danger in being in the midst of lepers is in contracting the disease through transmission by bedbugs and mosquitoes.

Dr. DYER. The bedbug is practically the only insect that would be likely to carry it, as that is the only insect that can live in an abandoned house very long. It might be carried for three or four years that way.

Senator WORKS. Do you think your State is prepared for taking care of these lepers adequately or reasonably?

Dr. DYER. I think it is reasonably prepared; yes.

Senator WORKS. Why would it not be possible to care for patients there from other States?

Dr. DYER. The object of the home was to get rid of leprosy in Louisiana, and, with that end in view, it would not be a good policy to receive patients from other States.

Senator WORKS. But the object has not been attained, has it?

Dr. DYER. No; but that is probably due to the fact that investigation of leprosy within the State of Louisiana has not been sufficiently exhaustive to bring all the patients into that home.

Senator WORKS. How many leprosy patients do you think you have in Louisiana, outside of your institution?

Dr. DYER. I think the number is probably three times the number of inmates.

Senator WORKS. That is, the total number in Louisiana would be three times the number you have in the institution?

Dr. DYER. Yes.

Senator WORKS. I meant including them all—that is, outside of the institution.

Dr. DYER. If we deduct 105 from three times that number, you would have 210. I would say there are probably 300 lepers in Louisiana.

Senator WORKS. There is this question involved in it, how far the United States Government should go in dealing with a question of that kind. From California there is a bill introduced here asking the Government to appropriate money to take care of tubercular patients, of whom a great number are brought there by the favorable climate and other conditions which people seem to consider will enable them to recover more quickly. Of course, if we start in that

direction, it is hard to tell where we will stop. I do not sympathize at all with the tuberculosis bill, although it is intended to benefit my own State. I think California can take care of her tubercular patients, and I think it should do so. That may be so in regard to leprosy, too. I think that is an important question.

Dr. DYER. I should like to meet that.

Senator WORKS. I should like to have you meet it.

The CHAIRMAN. We would be very glad to have you say something on that, Doctor.

Dr. DYER. I have not tried to argue that Louisiana had a majority of the lepers in the United States. I want to remove that impression.

Senator WORKS. I am not speaking particularly of Louisiana, or particularly of any other State. I am talking about all the States.

Dr. DYER. I understand. The reason why Louisiana has apparently more lepers than any other State in the Union is because Louisiana has tried to take care of its lepers, and has induced a count of the lepers of the State, which has not been done elsewhere, except in Massachusetts and California. Massachusetts started with two or three patients, and now has nearly 20 in its institution on Penikese Island. In New York City, at a demonstration in 1912, there were introduced 17 or 18 cases, simply to exhibit the kinds of lepers they had. A short while ago it was estimated that there were 100 lepers in New York City. Cases have been reported rather conspicuously from other places, like Cincinnati and Chicago, and occasionally a case from St. Louis. A true count has not been made of the number of cases. The count of the Public Health Service is adequate, because it could not be based upon a thorough investigation. They wrote to the local health authorities who were supposed to know of cases in their localities, and the report was based on the answers received to their inquiries. There could be no exhaustive search made for cases. It is known that cases to a considerable number exist in Florida, Mississippi, Louisiana, and Texas. In some of these States the disease is known to be prevalent.

In a report drawn up 12 years ago, following the report of the Public Health Service by two years, the total number of cases I found was over 400. I simply used reports which had been made in the medical journals to arrive at my statistics, together with those cases which were reported from institutions which cared for lepers in this country.

I think the argument for a national leprosarium is probably greater than for an institution for tuberculosis. I would put it this way: The patients with tuberculosis have a large sympathy from the general public. The patient with tuberculosis travels on the public carriers; he goes to different resorts and places where he may be cared for in sanatoria; while, on the other hand, there are very few States that do not discriminate against the leper. If it were known that a leper was on a train the chances are he would have the train to himself because of the public horror of the disease. This reflects upon the leper himself in so much that it places him in the attitude, the mental attitude, of the criminal. He is discriminated against in all public places, to the end that he becomes an outcast and an object of horror in spite of the fact that the

danger of contagion from him is about 1 to 100 as compared with the tubercular patient. I think that anyone who has lived in a community with lepers, who has had much contact with the leper himself, and has studied the psychology of the leper, must realize that he is entitled to large consideration. He not only bears all the burdens of his disease, but he also bears the burdens of centuries of opprobrium which makes him psychopathically different from a patient suffering from any other disease. For that reason they need just that much more care. I have seen a young girl, in excellent circumstances, starting out as a beautiful specimen of girlhood and growing, in three or four years, into a horrible and loathsome object. There is no other disease that imposes such a burden upon the patient as does leprosy.

Senator WORKS. The question is, Who should render the service; the States or the Government? As far as traveling on the same car is concerned, and the consequent transportation of the disease from one State into another, that comes under the National Government, undoubtedly; but isn't it the duty of the State to bear the burden of taking care of their own native-born citizens, like they are doing in Louisiana and in California and in Massachusetts? Now, I understand that there the question is not Federal. I think adequate provision ought to be made for these people. There is no doubt about that. It is strictly a humanitarian question. But there is serious question as to how far the National Government ought to go in matters of this kind.

Dr. DYER. The argument I think can be met at once. We have isolated cases. That happens all the time. For example, in the State of Pennsylvania there may be five lepers; there may be five in the State of Arkansas; and there may be a few States in the Union where there are no lepers at all, but where there might be one found in the future. It would seem to me that there should be some sort of concerted action by those States to take care of the lepers in their communities. As soon as the interest extends into a number of States it becomes the interest of the National Government. Louisiana is not asking here for her lepers to be taken care of; I am not here for Louisiana, but I am here at the invitation of your chairman, to present this matter to your committee. Louisiana has been willing to take care of her own lepers, but I do not think it is willing to take care of those from other States. If the National Government took over this function, Louisiana would be glad to get rid of her burden of taking care of these people, and to get rid of the tax which it lays upon the people. I think that would be true in every other State.

The CHAIRMAN. What is the average annual cost of maintaining this institution in Louisiana?

Dr. DYER. The appropriation is about $20,000 a year.

Senator SMOOT. That is about $200 a patient?

Dr. DYER. About $200 a patient; yes.

The CHAIRMAN. What is the value of the institution?

Dr. DYER. I should say about $30,000. The buildings erected are mostly frame structures.

The CHAIRMAN. In connection with Dr. Dyer's testimony, I wish to say, in introducing this bill, I had not heard from a single man in

Louisiana on the subject. No one there had called it to my attention. I was aware, of course, that my State had had a leper's home and was taking care of its lepers in what I conceived to be a magnificent manner. This matter was first brought to my attention by Mr. Danner, who is American secretary of the mission to lepers. We talked it over, and he told me of the number of lepers in the United States, of the horrible condition of many of them, some of them being in solitary confinement and suffering like criminals, and his story impressed me with the necessity for something being done, and I introduced this bill at his suggestion. The bill did not come from Louisiana at all. The situation was laid before me, and seemed to me to be a matter that ought to be taken up, particularly in view of the fact that none of the States with the exception of Massachusetts and California and my own State of Louisiana had taken steps along this line. I simply make this explanation to show you that the bill was not introduced for the State of Louisiana.

Senator WEEKS. Of course not.

Senator WORKS. I was not intimating that Louisiana alone was interested in this question. I was rather putting it on the broader ground that any State alone was interested in it or should be interested enough to take care of her own citizens and that the burden ought not to be shifted to the Federal Government. I did not have any particular reference to Louisiana.

Dr. DYER. I think I understood you. In connection with the last phase of what I had to say it probably appears that Louisiana has a majority of the lepers of the United States. Louisiana really has a minority of the lepers and not a majority.

Senator SMOOT. We all agree that lepers should be isolated. I think there is no division of opinion on that. We all believe that smallpox cases should be isolated, and we all believe that each State should take care of its smallpox cases within the State. A differentiation can be made between smallpox cases and leprosy cases to this extent, that smallpox can be cured or stamped out in a short time. It is only a short time after it breaks out until the patient is either dead or well. Now, in the case of the leper, once a leper he is a leper forever.

Dr. DYER. Unless he is cured.

Senator SMOOT. I have never heard of any cures. There may be some.

Dr. DYER. That is important, as the last phase of the argument.

Senator SMOOT. I do not know of any. I would be very much pleased to learn that there was a cure for leprosy.

Dr. DYER. Oh, yes.

Senator SMOOT. Have you ever cured any in Louisiana?

Dr. DYER. Yes, sir.

Senator SMOOT. How many?

Dr. DYER. About 30 cases in the last 20 years.

Senator SMOOT. Do you know whether any of those cases to-day are alive?

Dr. DYER. Several of them; three or four of them I have seen walking in the streets of New Orleans lately.

Senator SMOOT. How long have they been well?

Dr. DYER. Some of them have been well for 19 years.

Senator SMOOT. You have studied the details of it from a medical standpoint, which, of course, I have not; and you have followed the individual cases, where I have not. I have only followed leprosy as a whole, as I have seen it.

Dr. DYER. Yes.

Senator SMOOT. You, of course, have studied it from a medical standpoint?

Dr. DYER. Yes.

Senator SMOOT. Do you know what percentage of cases on the Hawaiian Islands, for instance, have been cured?

Dr. DYER. No; I do not.

Senator SMOOT. Do you know of any cases that have been cured at Molokai, say?

Dr. DYER. I do not know. I am not familiar with the course of treatment there. There has been issued within the last two years, from the Public Health Service, a report of the work done in the Philippines by Dr. Heiser, which shows a number of cures.

Senator SMOOT. I can not say as to the qualifications of care and attendance, from the standpoint of a physician, but I do know that on the island of Molokai, in the Hawaiian Islands, every care is given a patient, and I have understood the patients have the very best medical treatment.

Dr. DYER. I will tell you of the experience Dr. Heiser had in Louisiana. Dr. Heiser, an officer of the Public Health Service, was director of health in the Philippines. While on furlough in the United States he wanted to visit the Louisiana home and see how it was conducted, with an idea of getting some suggestions for his work in the Philippines. He came and after a thorough examination of the patients there he was very much struck with the ameliorated condition of many of the inmates, and he asked with regard to the treatment, which was not new at all. It had been used for a couple of hundred of years in India.

He asked, "How long does it take you to get results?" and I said, "The patient seems to get better in six to eight months, but we have never cured a case in less than three years." He seemed very much astonished, and said that he had expected to get results in three or four months. Now, gentlemen, that is the impression most people have. I know of cases in Louisiana where a patient did not show any sign of improvement until after three years, and it was five years before the patient was free from the disease.

Senator SMOOT. Do you think the leper should be in a warm climate or in a moderately cold climate?

Dr. DYER. The disease seems to spread more and to grow more in tropical countries, and from that I should make the deduction that it would be very much better to have lepers in the colder climate, rather than having them in the Tropics. Leprosy, of course, spreads wherever it is planted—it makes no difference whether in Greenland or Norway or whether it is in Central America or South America or where it may be. It seems to spread more in the Tropics than in the colder climates. It takes longer to establish the disease in the colder climates. That is the experience I think which accounts for the fact that the disease is very much more frequent in Mexico, for

example, and in Central America and along the Gulf coast and in the West Indies than it is farther north.

Senator SMOOT. On account of sanitary conditions, doubtless. I have noticed that people that drink ava freely or live in squalor, parpicularly the first, are people that are most affected by leprosy. The people I refer to were much addicted to drinking what is called ava, which is made from a root. It has a tendency to crack the flesh. I have seen the hands of natives cracked wide open. There are many cases of that kind that have developed into leprosy. I have thought that perhaps that was the basis of bringing on an attack of leprosy, through, of course, I think, uncleanly conditions and surroundings. That, however, may be only incidental.

Dr. DYER. I think that is only incidental.

The CHAIRMAN. Would it be convenient for you to furnish the committee with the 30 cases that have been cured?

Dr. DYER. I would have to do it by number and not by name.

The CHAIRMAN. You can do it by number?

Dr. DYER. Yes, sir. A report of some of these cases was published in 1905.

The CHAIRMAN. I would like to make it a part of our record here.

Dr. DYER. I shall be glad to furnish it.

The CHAIRMAN. Please furnish it, so it can be attached to this report.

(The matter referred to was subsequently submitted and is here printed in full, as follows:)

[Extract from "The cure of leprosy," the New York Medical News, July 29, 1905, by Isadore Dyer.]

The results from the use of chaulmoogra oil have been better than ever before, and I believe that such oil more nearly approximates a specific for leprosy than any treatment as yet suggested.

During the several years of my observation of leprosy I have acquired certain points which I have noted in the treatment of these patients.

1. Full diet, restricting only indigestible foods is indicated. The disease seems in nowise to be affected by fish or any other particular article of diet.

2. Baths are essential in the treatment. Hot baths twice a day, with or without soda, are effective.

3. The patient needs tonics, febrifuges, and should be watched for intercurrent or complicating diseases, such as malarial infection, pleurisy, pneumonia, grippe, and the like.

4. Strychnine is a sine qua non in the treatment of leprosy. My assistants and I lay down the rule that a leper should always take strychnine—the sort and size of dose to be regulated by the patient himself.

5. When chaulmoogra oil is given it is better endured before meals than after. It is best taken in capsules, in hot milk, or in milk of magnesia. The dosage should be begun small, say 3 drops, and increased every second or third day until as much as 120 to 150 drops of the oil are taken at the dose.

At times it is advisable to give the oil in pill form. This can be done either combining it with extract nux vomica and ordinary excipients, or a very effective way is with tragacanth and common soap.

6. Above all things individualize the patient. Watch for improvement, and if it does not show in three months wait six months; if it does not show in six months, wait a year or longer. But keep on driving at the treatment until the patient dies or gets well. I have on record one patient who did not show any signs of improvement for two years, but who is now well.

7. When all evidences of the disease are gone insist on a continuance of treatment. It may not be necessary, but it makes sure.

I am not the first to argue the curability of leprosy. Every center of leprosy shows the disease one which runs a natural course. Some cases fulminate and destroy the patient in a few months. Other cases are slow in their onset and are

slow in their outcome. Yet other cases will show small evidence, which disappears, leaving no trace and never returning. There are all grades of the disease, and the care of each must be as each directs. It only remains for me to tabulate those cases of my own which, in my opinion, are cured of the disease.

Case I.—Lizzie O'C., aged 19 years, first came under observation at the Charity Hospital in the early part of 1894. She presented characteristic macules on both legs. On her left foot, plantar surface, under the ball of the great toe, there was a typical trophic ulcer, with the odor and process characteristic of this leprous manifestation. Treatment with strychnine and chaulmoogra oil was established. In six months the lesions of the disease disappeared, and after more than a year had not returned.

Case II.—Martin O'C., father of Case I. Disease developed seven years after it had appeared in daughter. This case presented the following history: Aged 62 years; native of Ireland; laborer; seen at Charity Hospital in the fall of 1895. Lesions presented: One large leprous macule on the forehead; one on the arm of the right side and one on the leg. All of these were uniform in size, being about 2 inches in their long and 1½ inches in the shorter diameter. The lesions were in the form of irregular ellipses of a dull red color and somewhat elevated. Anesthesia was marked in each. The eruption had been out only a few months, and because of the rapid recovery of the daughter she had brought her father for treatment. The evidences of the disease rapidly disappeared under strychnine and chaulmoogra oil. The patient reported for observation for six months.

Case III.—August R., male, aged 47 years; native of Louisiana. Macular anesthetic leprosy, torphoneurotic type. Came under observation in April, 1897. The antecedent history in this case was clear. Periodic attacks of rheumatoid pains in the right arm and forearm were followed by first a sense of numbness and then contraction of the fingers. When seen the arm was swollen and the ulnar nerve somewhat thickened, with a nodosity the size of a hazelnut just below the elbow.

The last three fingers were contracted and could not be straightened, the effort to do so causing pain along the whole forearm. On these three fingers there was an eruption of bullæ, in size about that of a silver dime; in number four or five. On the dorsum of the hand there were typical anesthetic macules. The anesthesia could be well determined fully one-third the way up the ulnar side of the forearm. From April 6 to June 22 salicylate of soda, strychnine, iodides, were given with varying result so far as the pain was concerned. The deformity persisted. On June 28 injections of antivenomous serum was begun. In all 11 injections were given in doses varying from 1½ to 3 cubic centimeters and injected in various points of the body, chiefly along the ulnar nerve and in the interscapular area. Total amount injected, 34½ cubic centimeters. On August 30, 1897, the following note was made: "There is faint rosiness over base of third finger, at second and third joints and over last phalanx; the same discoloration over the phalanx of little finger. The patient has complete use of the hand and forearm and complains only of stiffness at night in the third finger. He has improved in general health and weighs 186 against 174 pounds at beginning of injections."

This patient took strychnine sulphate in one-sixtieth grain doses throughout, and this was maintained afterwards for some months. In January of 1898 there was no evidence of the disease, and up to 1902, when patient was last seen, there had been no further evidence.

Case IV.—Henry P., male, 45 years old; carpenter. Macular anesthetic leprosy with trophic changes in left hand. First seen November, 1896, at the New Orleans Polyclinic. The evidences of leprosy presented were as follows: Face, general duskiness, without distinct lesions. Ears thickened. Back, one small macule over the loin. On the right arm a distinct mottled lesion, just at the origin of the ulnar nerve; it was irregular in shape, rather ovid, with the long axis running diagonally across the inner aspect of that part of the forearm. Lesions dark brown, reddish. On the left arm one lesion just at elbow joint. On the outer aspect of the arm another lesion like that on the right arm. On the flexor surface and inner aspect of this forearm, 3 inches above the wrist, a lesion as large as a silver dollar, purplish brown in hue. On the third finger, dorsum, deep purplish lesion running the entire length of the finger. A similar lesion covered the first phalanx of the second finger. The left hand presented the characteristic claw hand. On the right thigh a large round lesion 1½ inches in diameter. All lesions markedly anesthetic to pain.

Up to July 7, 1897, patient had been treated variously with chlorate of potash, salicylate of soda, together with strychnine, without result. The strychnine was continued and antivenomous serum injections begun on July 7, 1897. A total of 18 injections were employed, 48½ cubic centimeters in all; maximum injections, 5 cubic centimeters; minimum, 1 cubic centimeter. A note made August 30, 1897, relates that the lesions had disappeared in half their total area. The full use of hand restored. All injections had become painful and the patient had gained 5 pounds in weight. The injections in this case were kept up at less frequent intervals until the spring of 1898, when they were discontinued because of the difficulty of getting proper serum. The strychnine was maintained, however, and the patient reported regularly for observation. In June, 1898, he resumed his work as a carpenter, with no evidence of the disease left about him and without any recurrence whatever up to 1902. Then he died of pneumonia.

Case V.—K. G., aged 45 years; merchant. Presented July 20, 1898, with some six leprous tubercles on his face and as many more distributed on different parts of the trunk and legs. Each of these was fully as large as a small marble and characteristic in clinical appearance. One of the tubercles was excised and the leper bacillus demonstrated. Patient was put under treatment, but inside of three weeks his face was covered with new lesions; proportionately as many developed on the rest of the body. As this case had developed altogether in less than three months, he was advised to change climate, and left New Orleans. He returned at the end of two years, having been subjected to very rigorous treatment in Europe, and on my examination was found free of the disease. Since 1900 I have seen this patient at regular intervals of four or six months, and there has been no evidence in any way whatsoever of a recurrence. His treatment consisted in strychnine and chaulmoogra oil.

Case VI.—Mrs. G. Peterson, aged 27 years. Applied for treatment at the Charity Hospital, September 22, 1899. She presented a deep-seated macular leprosy tubercle the size of a silver dollar on the right side of her neck. There were two lesions twice this size on each leg. On both hands there were leprous nodules and the ulnar nerve on the left side was perceptibly enlarged. Some contraction of the two last fingers. Patient took strychnine in one-fiftieth grain doses and chaulmoogra oil in increasing doses until 40 drops at the dose were taken. In October, 1902, there was no evidence of the disease. This patient has reported regularly at intervals of every four months up to the present time, and there has been no recurrence.

Case VII.—Blanche B., aged 12 years. Reported for treatment July 22, 1901, presenting a typical lesion the size of a silver quarter over the right maxillary region. Another lesion as large as the palm on the right leg. Both typical leprous macules. One-sixteenth grain doses of strychnine sulphate and increasing doses of chaulmoogra oil were administered. A maximum of 30 drops was reached. In June, 1902, both lesions had disappeared. Treatment was continued until 1903. Patient has reported at intervals since then and there has been no recurrence.

Case VIII.—A. G., aged 33 years; female. History of the disease of 10 years' standing, progressively increasing until I saw the case. At this time the face was covered with ulcerating tubercles; the hands were considerably swollen, here and there presenting bullæ and ulcers of typical character. No area of the body was free of discoloration, macules, or tubercles. Treatment was begun in March, 1901. One-fiftieth grain strychnine sulphate was administered three times a day. Chaulmoogra oil was given in increasing doses to 60 drops three times a day. In addition, arsenic and glycerophosphates were administered from time to time. The nose was kept flushed with glycothymolin and hot baths with corbonate of soda at 95° F. were given twice a day. In July, 1903, the patient was free of any leprosy lesion, bacteriological examinations of secretions and urine proved negative. Up to the present time the patient has been bacteriologically examined three times with negative results. There has been no recurrence of the disease.

Case IX.—J. C., aged 13 years. This boy has been the subject of widespread newspaper report because of his discharge from the Louisiana Leper Home. He was admitted in 1902 as a typical case of tuberculous leprosy. His treatment consisted in one-sixtieth grain doses of strychnine sulphate and chaulmoogra oil up to 100 minims at the dose. His improvement began promptly, and at the end of one year the tubercles had disappeared. In June, 1904, there were some small areas of pigmentation left. In December, 1904, after negative bacteriological examination and the lack of any evidence whatso-

ever of the disease, the boy was discharged. He is still kept under observation and up to the present time remains well.

Case X.—S. J., aged 38 years; native of New Orleans. First seen March 30, 1898. Typical tuberculous leprosy involving face, hands, legs, and back. The patient persistently improved under chaulmoogra oil and strychnine, never reaching more than 40 drops of the oil. She has been free of any evidence of the disease since 1903.

It is to be remarked that almost all patients taking chaulmoogra oil have improved.

Of the present inmates in the home there are fully a half dozen who have improved to the point of certain arrest in the disease; two of them being now kept under observation with the idea of their discharge at no far distant date.

Dr. DYER. I will also have other cases furnished from the statistics of the Southern Leper Home.

Senator WORKS. What is the remedy for leprosy?

Dr. DYER. The remedy for leprosy?

Senator WORKS. Yes. You say there is a remedy.

Dr. DYER. Yes. We have used chaulmoogra oil, which has been used in India for over 200 years. That has also been used by Dr. Heiser and his group of assistants in the Philippines.

Senator WORKS. Has no serum been discovered for leprosy?

Dr. DYER. Several of them, but none has proved efficacious. There have been five at least.

Senator SMOOT. Have the cases that have been cured been well-developed cases, or have they been only in their first stage?

Dr. DYER. Some of the cases were of six or eight years' duration when treatment was begun. I think it would be interesting to make a part of your record in this matter the report of Dr. Heiser from the Public Health Service. I am not speaking for the Public Health Service, of course; they have representatives here. I think this report is interesting, though. It was published, I think, in the fall of 1914.

The CHAIRMAN. We would be glad to do that, Doctor. We are glad to have your suggestion.

Senator SMOOT. I suppose that report would show the prevalence and treatment of the disease in the Philippines.

Dr. DYER. Yes; if the committee desires, I will insert it.

The CHAIRMAN. I wish you would.

(The report referred to was subsequently submitted, and is here printed in full, as follows:)

LEPROSY—ITS TREATMENT IN THE PHILIPPINE ISLANDS BY THE HYPODERMIC USE OF A CHAULMOOGRA OIL MIXTURE.

[By Victor G. Heiser, surgeon, United States Public Health Service, director of health for the Philippine Islands.]

In the United States Public Health Reports of September 5, 1913, two cases, and in the United States Public Health Reports of January 2, 1914, two additional cases, or a total of four, were reported as having been apparently cured of leprosy and to have remained cured for a period of over two years. The first two cases were treated with a mixture of chaulmoogra oil, camphor, and resorcin, and in addition they received at irregular intervals a vaccine prepared in a number of different ways from a strain of so-called leprosy cultures of Clegg. The other two cases received only hypodermic injections of the chaulmoogra oil mixture, no vaccine being used. The clinical records for the above cases, beyond establishing the diagnosis and that they were microscopically negative after treatment, were incomplete. With the hope, therefore, of having more satisfactory data available, 12 cases, which included the different types of leprosy, were placed under treatment February 21, 1912, with the same

chaulmoogra oil mixture as was used in the cases already reported as apparently cured. The object of this paper is to present the results that were obtained.

* * * * * * *

Statistical summary.

Cases placed under treatment	12
Cases taking treatment throughout period	9
Cases apparently recovered and microscopically negative	1
Cases in which clinical evidence of leprosy practically disappeared	4
Cases showing only slight evidences of improvement	1
Cases declining to take prescribed treatment	3

NET RESULTS.	Per cent.
Apparent cures	11.11
Apparent clinical recoveries	44.44
Showing marked improvement	33.33
Showing only slight evidence of improvement	11.11

BRIEF REVIEW OF THE STEPS LEADING TO THE PRESENT TREATMENT.

It has been customary in the Philippine Islands to try any treatment for leprosy that came to the attention of the bureau of health and in the employment of which we could satisfy ourselves that no harm would be done the patient. We have always been very fortunate in having volunteers for any form of treatment which it was proposed to try. Most of the remedies had no noticeable effect. However, some apparent cures have resulted from time to time with the different treatments used. For instance, several lepers were apparently cured by the use of the X ray; others were apparently cured by the administration of crud chaulmoogra oil by mouth, but regardless of the treatment used the disease always returned before the expiration of a year. In view of this experience, it was deemed advisable to wait for a period of two years before reporting apparent cures. That a period of two years, or perhaps even a longer time, should elapse before a case may be considered as cured is well illustrated by Case I. Reference to the microscopical record shows that this case was negative from May 19, 1913, to February, 1914. April 15, 1914, it was positive again, and this in spite of the fact that the physical signs of leprosy have not returned.

Chaulmoogra oil by mouth has been used at the San Lazaro Hospital since the early years of American occupation of the Philippine Islands. In 1907 our attention was directed to the success which was had by Dyer, of New Orleans, in the treatment of leprosy with chaulmoogra oil. In 1908 a conference was had with him and through his courtesy Dr. Hopkins showed us the cases that had been treated by Dr. Dyer's method at the Iberville Parish Leper Colony, as well as the practical details for administering the oil, the strychnine, and the sodium bicarbonate baths.

Cases were soon afterwards treated at the San Lazaro Hospital, Manila, by Dyer's method and much more success was had than formerly. Unfortunately, however, on account of the great nausea which was produced, very few cases were able to take the oil for a period of more than a few months. Every effort was then made to find a way by which the oil might be given without causing this untoward effect. Various preparations of the oil in which the emetic principle had been removed were tried, but these apparently had no influence on the disease. Emulsions of different kinds were prepared. Capsules were coated with various substances with the idea of having them pass through the stomach unaltered, but nausea continued to occur and scarcely anyone could be induced to take chaulmoogra oil for a longer period than three months on account of the nausea. The few who persisted beyond this period usually showed great improvement and a few apparent cures took place. Enemas of chaulmoogra oil were also tried, but they had no apparent influence on the disease.

A review of the literature showed that the oil had been used hypodermically. That method was then tried, but great difficulty was had owing to the failure of the oil to be absorbed. To overcome this difficulty the Merck Co. suggested that chaulmoogra oil might be combined with ether or camphor. The suggestion was put into effect and it was found that camphor gave the best re-

sults. It then occurred to Dr. Mercado, the house physician at the San Lazaro Leper Hospital, to combine the camphor with the resorcin prescription of Unna. The mixture was prepared as follows:

Chaulmoogra oil	c. c. 60
Camphorated oil	c. c. 60
Resorcin	grams 4

Mix and dissolve with the aid of heat on a water bath and then filter.

Soon after this mixture was used hypodermically over a period of several months, noticeable improvement took place in the appearance of the lesions and in the general health. The treatment was irregularly used on a number of cases. Among others, two lepers took it who had previously been treated without success with a vaccine made with bacilli grown in accordance with the method of Clegg. These two cases recovered early in 1911, after a few months' treatment and apparently remained completely cured for a period of two years, when they were discharged from the hospital on probation. Later, two additional cases recovered that had no other form of treatment except the hypodermic injections of the chaulmoogra oil mixture, from which it seems reasonable to infer that the vaccine had had no effect in the first two cases.

KIND OF OIL USED.

On account of the question raised recently in a number of medical journals as to the genuineness of much of the chaulmoogra oil on the market at present, a sample of oil was purchased in the open market of Manila and a sample of oil was secured from the Indian Forests Economic Products Co. (Ltd.), of Chittagong, India. Both of these samples were sent to the bureau of science for analysis, with the following result:

	Standard.	Indian.	Stock.
Specific gravity	(at 25° C.) 0.951	(at 30° C.) 0.9466	(at 30° C.) 0.9543
Ref. index	1.478	1.478	1.478
Sap. number	213.0	212.9	216.0
Hanus iodine No.	103.0	102.2	103.5

There is little choice, both oils being close in their constants to the standard oils.

A. H. WELLS, *Analyst.*
H. C. B.

The oil used in the tratement of the cases reported in this paper was that referred to in the foregoing analysis report as "stock."

Experience with chaulmoogra oil at San Lazaro Hospital, when administered by mouth, has shown that the crude oil is much more efficacious than the refined product. When used hypodermically there is apparently no difference whether the crude or the refined oil is used, but accurate data with regard to this point are not yet available.

DETAILS OF TREATMENT.

The injections are usually made at weekly intervals in ascending doses. The initial dose is 1 c. c., and this is increased to the point of tolerance. Much difference exists among the cases as to the amount of the mixture which they are able to take. In some cases a few cubic centimeters produce marked reactions in the lesions, accompanied by fever and cardiac distress. Sometimes it is better to reduce the amount of the dose and inject at more frequent intervals. The object sought is so to regulate the dose as to prevent reactions of too violent a character. Quicker results are also apparently obtained when it is possible to inject the mixture into large leprous deposits or to divide the dose by injecting it into a number of smaller infiltrations. Experience so far leads to the inference that with additional study the prospects seem fair for greatly improving upon the results that are obtained at present. Attention is drawn to the fact that no strychnine was used. Many writers have regarded strychnine as an essential part of the chaulmoogra-oil treatment. Saline purgatives are freely employed. Two per cent hot sodium bicarbonate tub baths are

prescribed every other day. Those who take prolonged baths regularly seem to improve more rapidly than those who do not.

* * * * * * *

CONCLUSION.

The present stage of the development of the treatment herein described does not warrant a claim that anything like a specific for leprosy has been found, but experience does show that it gives more consistently favorable results than any other that has come to our attention, and it holds out the hope that further improvement may be brought about. It produces apparent cures in some cases, causes great improvement in many others, and arrests the progress of the disease in almost every instance. We have on hand at present over 20 persons who have become microscopically negative since they began the treatment. The treatment is apparently equally efficacious in all forms of the disease; that is, the tubercular or hypertrophic, the anæsthetic and the mixed. A series of cases is now undergoing the treatment for the purpose of more accurate study of its effect in the different forms of the disease and whether any difference exists as to sex. Experience also shows the great desirability of further trial in the hands of other workers in different parts of the world, with the hope that improvements may result. Finally, it is always important to remember that there are many treatments for leprosy which apparently cause some improvement, and it not infrequently happens that when cases of leprosy are placed under better hygienic conditions and have hospital care, or for other reasons not understood, the disease is often arrested, in a few instances improvement results, and that apparent cures may take place without any treatment.

Senator BECKHAM. How is that chaulmoogra oil, Doctor, as a remedy?

Dr. DYER. It seems to be very efficacous in ameliorating the symptoms of leprosy, even when it does not wholly effect a cure.

Senator BECKHAM. How is it given?

Dr. DYER. We give it by the mouth, while in the Philippines they give it by the hypodermic method. At the leper home in Louisiana none of the patients has been forced to undergo treatment, and most of them object to the hypodermic method, so we have little experience with the Heiser method.

The CHAIRMAN. You say that a patient sometimes resists treatment for a long time?

Dr. DYER. Yes, sir; sometimes for five or six years. Any leper that has not advanced to the point of a destructive stage is amenable to treatment. As to whether he will get well or not depends entirely upon his own ability to take treatment. My own belief is that if patients with leprosy were placed in an institution where the treatment could be made systematically and under the direction of an efficient medical force, which the Louisiana home has not—it has a visiting physician who is qualified, but who is not paid enough to devote his whole time to the work—they would almost always recover, if taken early. My own belief is that 50 or 60 per cent of them could get well.

I will prepare a list of the cases discharged as cured from the Louisiana Lepers' Home.

(The list referred to was subsequently submitted, and is here printed in full, as follows:)

NEW ORLEANS, *March 4, 1916.*

Dr. ISADORE DYER,
124 Baronne Street, New Orleans.

DEAR DOCTOR: In reply to your communication concerning the cases discharged as cured from the lepers' home, I trust the following brief report will contain the desired information:

1. Hospital record 44. Female; age 50; white; admitted August 10, 1899; discharged November 28, 1905.
2. Hospital record 62. Male; age 39; white; admitted March 7, 1902; discharged May 27, 1910.
3. Hospital record 84. Female; age 48; white; admitted June 6, 1904; discharged May 1, 1906.
4. Hospital record 89. Female; age 45; white; admitted September 15, 1904; discharged September 19, 1911.
5. Hospital record 94. Male; age 70; colored; admitted April 12, 1905; discharged September 5, 1906.
6. Hospital record 106. Female; age 14; white; admitted May 6, 1906; discharged December 17, 1909.
7. Hospital record 163. Female; age 35; white; admitted November 20, 1910; discharged December 5, 1912.
8. Hospital record 182. Female; age 53; white; admitted March 13, 1912, discharged July 31, 1914.
9. Hospital record 185. Female; age 65; white; admitted May 23, 1912; discharged October 21, 1914.
10. Hospital record 199. Male; age 46; white; admitted April 17, 1913; discharged November 19, 1915.
11. Hospital record 205. Male; age 11; white; admitted June 18, 1913; discharged December 7, 1913.
12. Hospital record 220: Female; age 52; white; admitted April 8, 1914; discharged June 10, 1915.
13. Hospital record 221: Female; age 58; white; admitted April 8, 1914; discharged April 8, 1915.

NOTE.—Age stated here indicates age at the time of admission.

All of the above cases were admitted to the home while still in the incipient stage of leprosy, and were treated with chaulmoogra oil given internally in doses of from 3 to about 100 drops three times daily. The oil was given in capsules and the doses gradually increased to the maximum, according to the tolerance of the individual. Strychnine was also given in moderate doses three times daily, and daily prolonged hot baths.

Cases were discharged when no clinical evidences of leprosy remained and no acid-fast bacilli could be found in the seat of old lesions or in the nasal secretions.

Respectfully, yours,

RALPH HOPKINS, M. D.,
Attending Physician of Leper's Home of Louisiana.

The CHAIRMAN. You said that in Louisiana there were probably 315 lepers, and that your investigations had discovered in the neighborhood of 400 known cases in the United States.

Dr. DYER. That was several years ago.

The CHAIRMAN. Several years ago?

Dr. DYER. Yes; 1904.

The CHAIRMAN. From the best information you have, how many lepers are there in the United States, in your judgment? Just give us an estimate.

Dr. DYER. I should, of course, have to estimate it. I think there are from 800 to 1,200 cases in the United States. I am only judging that upon the proportionate development of the disease in Louisiana, even when the disease is under control. Of course the increase would be greater if the disease has been allowed growth, absolute growth, such as in a place like New York, where it has been known for the last 30 or 40 years, and where it has grown and developed without restraint.

Senator SMOOT. There are sections of the country free from it, are there not?

Dr. DYER. Oh, yes; there are cases reported in Oregon and California; but when you come East, to the Dakotas, you will probably find that they are free from disease, as are also probably Wyoming

and Montana; but when you get down to Arkansas you find an occasional report of a case. There are cases occasionally reported also in Illinois, Iowa, and in Kansas, and up to Minnesota. Cases have been reported in Virginia, Ohio, Maryland, and in the Carolinas.

Senator BECKHAM. And in Kentucky?

Dr. DYER. Yes; we know there are cases in Texas, Louisiana, Florida, and Mississippi.

Senator BECKHAM. How many of those could probably be gathered together voluntarily in a common sanatorium?

Dr. DYER. I think that would depend on the way the institution was presented to the public. If it were presented as an institution, where an attempt was made to cure leprosy and where all provisions of a sanatorium were offered, I think most of them would go in voluntarily.

Senator BECKHAM. You believe in making it compulsory?

Dr. DYER. It would be rather hard to make it compulsory under governmental administration.

Senator BECKHAM. What leads you to say that?

Dr. DYER. I have come to learn how the patient views the matter, from my experience in Louisiana.

Senator WORKS. The power of the National Government in this matter is a serious question. It is a serious question how far the Federal Government should go. It is a question whether the Government would have the power to make a citizen travel from one State into another.

The CHAIRMAN. I think it would be constitutional for the States to pass laws requiring their citizens to go to such a sanatorium. What do you think about that, Doctor?

Dr. DYER. Of course, Mr. Chairman, I am not a lawyer, and I would not like to express an opinion on that. You gentlemen are better prepared to do so than I am.

The CHAIRMAN. Do you think your State would have the power to require your citizens to go to such a sanatorium as this bill proposes?

Dr. DYER. That is a question I shall have to leave to the lawyers.

Senator WORKS. That is a question on which even lawyers might differ.

Senator SMOOT. Yes.

The CHAIRMAN. I think we shall not be able to settle that here to-day.

Dr. DYER. You have some representatives here from the American Medical Association, which has indorsed this bill.

The CHAIRMAN. I was going to ask you if this measure, or one similar to it, had the indorsement of the medical profession of the United States.

Dr. DYER. So far as I know, it is indorsed by the medical profession. There are other gentlemen here who can speak perhaps more fully on that than I can. I should be glad to help on any other point, however.

The CHAIRMAN. Do you regard the establishment of the home in Louisiana as a very wise and beneficial institution in that State?

Dr. DYER. Oh, yes, sir. I was individually responsible for it. Leprosy in Louisiana in 1894 had no status beyond the fact that

lepers were objects of law. The law made no provision for their care. The contractor who took care of smallpox patients furnished for the lepers a building not in use at that time for smallpox. They were there in a very miserable state. The State legislature, as soon as the case was presented, saw the desirability of having some adequate provision for taking care of the lepers, both for the benefit of the lepers themselves and for the protection of the public.

The CHAIRMAN. The treatment you give the lepers is very humane?

Dr. DYER. Yes, sir.

The CHAIRMAN. Doctor, you make the lot of the leper about as happy as that of any unfortunate being could be, do you not?

Dr. DYER. Yes, sir.

The CHAIRMAN. Is it your opinion, Doctor, that the establishment of that home and the care that is given there and the study that is made of the disease will have a very great tendency to prevent the spread of leprosy in Louisiana and gradually to eradicate it?

Dr. DYER. Yes, sir. It is difficult to tell how many cases there might have been in Louisiana had the State not taken these steps. The institution was started in 1894. It has cared for more than 300 cases.

Senator WORKS. Suppose the National Government proposes to take over your institution and convert it into a national sanatorium, do you think that would be satisfactory to your people?

Dr. DYER. You mean to the people of Louisiana?

Senator WORKS. Yes. That would cover all the lepers in your State.

Dr. DYER. I should individually feel that that was not the best solution, in that you would simply be making a larger nest of the disease in a community that is already rather full of it.

Senator WORKS. You will find that difficulty everywhere. Every section of the country will object to the location of a sanatorium of that kind in it.

Dr. DYER. In locating a home in Louisiana we tried several sites before we got one that was suitable.

Senator WORKS. That is what the Government will try to do.

The CHAIRMAN. What would be the probable effect in the United States if some action—some concerted action—is not taken by the States themselves, or by the National Government, toward segregating the lepers and treating them systematically and properly.

Dr. DYER. The answer to that would be that the number of cases would gradually increase until it would become necessary to make some provision for them. That has been the experience of every country. As long ago as the year 1897 the question was raised at the Berlin Leprosy Conference and I think the United States was the only one of the more modern civilized countries that had not made provision. In Japan they had a number of leprosaria. In some of the States of South America, notably the United States of Colombia, they have made provision. In Cuba they have a leper hospital and have had for a number of years. They also have one in Porto Rico. In Jamaica they have isolated their lepers for a number of years. They also isolate their lepers in Canada.

The CHAIRMAN. How is it in the European countries?

Dr. DYER. They have made provisions in all the European countries. Of course leprosy has gradually died out there. In Germany

there were some cases. In France there was not a great number of cases. The cases were rather concentrated around the Mediterranean, in the Levant and in the Orient.

The CHAIRMAN. Has there been a system formed in Europe to segregate lepers and prevent the spread of the disease?

Dr. DYER. Yes; at the Berlin conference in 1897, all of the countries represented reported the care of lepers and the statistical occurrence of the disease.

Senator WORKS. I suppose there would be just as much reason and obligation on the part of a State to take care of its lepers as there is for it to take care of its insane. The States are all caring for their insane, and it would seem as if they ought to take as much interest in caring for their lepers, because they are more dangerous to the State than insane persons are in a great many ways.

Dr. DYER. In Louisiana the law pertaining to the control of lepers is identical with the law pertaining to the insane. Of course leprosy presents a little different problem. All the States have their insane, and their condition may be purely temporary, of course. With leprosy the question enters also as to the importation of the disease, which has not been seriously considered here this morning. So long as we are sending our representatives and citizens to extraterritorial possessions, they are not only liable to contract the disease there, but to bring it back with them to this country. It would be a great hardship upon United States citizens to be kept out of their own country on account of a disease which they contracted while in the service of their country in a foreign land.

Senator WORKS. We could not very well keep one of our own citizens out of the country.

Dr. DYER. That is a question to be considered.

The CHAIRMAN. We have one here—John Early.

Dr. DYER. Yes.

The CHAIRMAN. If there are no further questions, we will excuse Dr. Dyer.

Dr. DYER. Thank you.

The CHAIRMAN. Doctor, we are very much obliged to you. I will now ask Dr. Howard Fox to give us his views.

STATEMENT OF DR. HOWARD FOX, CLINICAL PROFESSOR OF DERMATOLOGY NEW YORK POLYCLINIC MEDICAL SCHOOL; ATTENDING DERMATOLOGIST HARLEM AND WILLARD PARKER HOSPITALS; PRESIDENT NEW YORK DERMATOLOGICAL SOCIETY; VICE PRESIDENT AMERICAN DERMATOLOGICAL ASSOCIATION.

The CHAIRMAN. Doctor, will you state in your own way any points you can make in regard to such an institution as is suggested by this bill, and the experience you have had with leprosy in the United States?

Dr. FOX. Before speaking about the bill in question I would like to say one or two words as to whether leprosy presents a real public-health problem for the United States.

In the first place, no one can deny that leprosy is a very terrible disease, frequently loathsome, mutilating, and I feel that in only a very small percentage of cases is the disease curable.

In the second place, I do not think there is any doubt that leprosy is contagious. It is true that the disease may require a great many years to make its symptoms apparent—even as long as 20 or 30 years. In spite of the fact that we do not know how it is carried from person to person, I think it is agreed that it is a contagious disease.

Leprosy is prevalent to some extent in the United States, it being estimated that there are between 500 and 1,000 cases. The exact number is very hard to determine. Many of them are imported. A great many cases do arise, however, in persons that have never been outside of the United States. It seems to me that if we continue to have the present number of cases, and no more, leprosy would still be a serious problem for the United States. No one can deny, however, that at some time in the future leprosy will suddenly increase in this country, as it has done in the Hawaiian Islands and a great many other countries of the world, and gain a strong foothold and become a serious and terrible problem with which to grapple.

If we agree that leprosy is a real serious health problem, it seems to me that the formation of a national leprosarium would be the best means of solving this problem. In the first place, it would protect the public health against leprosy; second, it would insure decent and humane treatment for the lepers themselves; and, in the third place, it would have economical advantages.

In regard to protecting the public health against leprosy, history shows that the only method of eradicating leprosy from any community is by segregation. Under the present system it is practically impossible to do this, owing to the utter lack of uniformity in the laws of the different States. For instance, Pennsylvania and Massachusetts have, I believe, rather stringent laws against lepers, while the Board of Health of New York has very lax laws. Consequently there are very few lepers in Pennsylvania or Massachusetts, while there are many of them in New York State. I stated at a meeting of the Academy of Medicine six years ago that I had personally examined 30 cases of leprosy in New York City in the course of one year. It is posssible that there are 50 or more cases in New York City all the time.

Senator SMOOT. Do you know what percentage of decrease there has been in the number of lepers of the island of Molokai from the highest number down to the number there to-day?

Dr. FOX. No, sir; I am not familiar with those figures.

Senator SMOOT. I was over there last year, and I was told that they had decreased since the segregation took place. From the time the largest number was segregated down to to-day there was over 50 per cent decrease.

Dr. FOX. I do not know the figures in the Hawaiian Islands, but that has been the rule all over the world. In the twelfth and thirteenth centuries in France there were, I think, 2,000 leprosaria for these unfortunates. After segregation had been practiced for some time leprosy became practically unknown.

The second point I want to mention is that the passage of this bill would insure decent and humane treatment for lepers. Everyone knows how at present lepers are fairly hounded from one State to another. A certain case about which we have all read was due more or less to public hysteria, and would not have occurred if the problem had been handled properly by the Federal Government. Further-

more, if all the lepers were brought together in one institution their lot would be bearable at least. It would not be so bad as it is now, where two or three, often of different nationality, are isolated in some lonely spot.

Senator WORKS. Misery loves company.

Dr. FOX. Yes, sir. In the next place, this system would be economical. Of course, it is apparent that the cost of taking care of the lepers under one institution would be more economical than in caring for them in a large number of small institution.s

The CHAIRMAN. What is the possibility of a very much more scientific study and investigation of the disease where a large number are segregated in one place than under the present system, where they are very much more scattered?

Dr. FOX. Of course, that would be another advantage that such a leprosarium would have.

The CHAIRMAN. As I understand it, Doctor, you would favor such a bill as this?

Dr. FOX. I am absolutely heart and soul in favor of the passage of such a bill.

The CHAIRMAN. Is it reasonable to suppose that your State is going to create such a leprosarium very soon?

Dr. FOX. I do not see very many signs of interest in it one way or the other.

The CHAIRMAN. How long have you had leprosy in New York, so far as the records show?

Dr. FOX. The transactions of our dermatological society show that the disease has existed there for nearly 50 years.

The CHAIRMAN. You say there may be 50 or more cases in New York City all the time? You have not the exact record?

Dr. FOX. No, sir; I have not the exact record.

The CHAIRMAN. Have you any idea how many there are in the State?

Dr. FOX. I suppose the majority of them are in New York City, because they are less conspicuous than in the country.

The CHAIRMAN. Of the 30 which you examined, how many were foreign born?

Dr. FOX. Most of them were foreign born.

The CHAIRMAN. That is one of the things that makes it a national problem, that a great many of our cases come from abroad, is it not?

Dr. FOX. Yes, sir.

Senator WORKS. It is for the National Government to say whether they shall be admitted or not, but once they have been admitted and become citizens of a State, that is another question.

The CHAIRMAN. Is it very hard, Doctor, to determine whether or not a person has leprosy?

Dr. FOX. It is absolutely impossible at times.

The CHAIRMAN. You say the disease does not show itself for some time?

Dr. FOX. From 10 to 15 to 20 years, sometimes.

The CHAIRMAN. Can you give us some of those terrible cases you speak of, sending them to me to insert?

Dr. FOX. Yes, sir.

The CHAIRMAN. We should also be glad to have you insert in the record some material on the diagnosis of leprosy.

(The matter referred to was subsequently submitted, and is here printed in full, as follows:)

THE WASSERMANN AND NOGUCHI COMPLEMENT-FIXATION TEST IN LEPROSY.

[By Howard Fox, M. D., of New York.]

The first to obtain a positive Wassermann reaction in a case of leprosy was Eitner in 1906. A similar report was made by Weichselmann and Meier nearly two years later. Since then it has been found by a number of observers that leprosy quite frequently gives a positive reaction. In testing 26 advanced cases of the disease Slatineanu and Danielopolu found 20 strongly positive, 4 moderately positive, and 2 weakly positive reactions. Jundell, Almkvist, and Sandman in a series of 26 cases obtained 4 strong and 4 moderately positive reactions. In 2 cases the result was unsatisfactory, while in the remaining 16 cases the reaction was negative. Of the positive cases 5 were of the tubercular and 3 of the maculo-anesthetic type. From this Sandman concludes that the occurrence of the reaction does not depend upon the type of the disease, whether tubercular or anesthetic. Meier, on the other hand, in a series of 28 cases found positive reactions only in the tubercular type of leprosy. All of the anesthetic cases gave negative reactions. The number of cases of each type was unfortunately not stated. Similar results were obtained by Bruck and Gessner, who found positive reactions in 5 out of 7 tubercular cases and negative reactions in 3 anesthetic cases. Positive reactions have also been obtained by Gaucher and Abrami in 8 cases and by Frugoni and Pisani in 9 out of 11 cases of leprosy, the type of the disease, however, not being stated.

Eitner was also the first to obtain complement fixation in leprosy, using an extract of leprous tissue as antigen. Similar results were later reported by Slatineanu and Danielopolu, Gaucher and Abrami Sugai, Pasini, and by Frugoni and Pisani. It was also found by Slatineanu and Danielopolu that complement could be fixed by leprous serum employing tuberculin as antigen. Complement fixation in leprosy was also obtained by Frugoni and Pisani by using tuberculin, tubercle bacilli, and extracts of sarcoma and carcinoma as antigen.

It has been my privilege during the past six months to have employed the Wassermann reaction in 60 cases of leprosy. Fifteen of these cases were seen in various clinics and hospitals in New York City. The remaining 45 were seen during a recent visit to the Leper Home in Louisiana, an institution under the direction of Dr. Isadore Dyer, of New Orleans. All of these 15 cases, with one exception, were tested by both the regular Wassermann and the Noguchi methods, the results in all cases being identical. The cases in Louisiana were tested alone by the more convenient method of Noguchi, owing to lack of time at my disposal. The technique used was the same as that described in some of my previous communications, and will be here omitted for the sake of brevity. It may, however, be remarked that the antigen used in the Wassermann test was an alcoholic extract of syphilitic liver. The antigen used in the Noguchi test consisted of acetone insoluble lipoids. The patient's serum in the Noguchi method was used in active condition. All of the cases examined were undoubted lepers, many of them having been under observation for years. No history of syphilis was obtainable in any case. Certainly no lesions were seen in any patient that could have been regarded as syphilitic.

To summarize the results of the 38 cases of the tubercular and mixed type, the reaction was negative in 7, weakly positive in 3, positive in 21, and strongly positive in 7 cases. Of the 22 maculo-anesthetic and purely anesthetic cases the reaction was negative in 19, strongly positive in 1, and positive in 2 cases.

It may be of interest to add that beside the 15 cases of leprosy examined in New York I have also seen or personally known during the past six months of 7 other cases (3 of Dr. J. McF. Winfield, and 1 each of Drs. William B. Trimble, M. B. Parounagian, F. M. Dearborn, and G. H. Fox). It will doubtless seem surprising to some that there should have been so many cases of leprosy in New York City during such a short space of time.

CASES OF TUBERCULAR AND MIXED TYPE WITH POSITIVE REACTION.

Case 1: Patient of Dr. S. Dana Hubbard, service of Dr. Jackson, Vanderbilt Clinic. I. W., West Indian negress, aged 33 years. Advanced case of tubercular type. Duration of disease, two years. Reaction: Strongly positive.

Case 2: Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. S. V., man, aged 40 years, born in Russia. Active fairly advanced case of mixed type. Duration, two years. Reaction: Strongly positive.

Case 3: Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. P. N., man, aged 42 years, Italian, Armenian. Advanced case of mixed type. Duration said to be two years. Reaction: Strongly positive.

Case 4: Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. S. V., man, aged 27 years, Italian. Very marked active case of tubercular type. Duration, three years. Reaction: Positive.

Case 5: Patient of Dr. L. Duncan Bulkley, New York Skin and Cancer Hospital. R. R., Russian woman, aged 60 years. Advanced case of mixed type. Duration, 10 years. Reaction: Positive.

Case 6: Patient of Dr. J. McF. Winfield, Kings County Hospital. C. W., negro, aged 26 years, born in United States. Mixed type of moderate severity, of eight years' duration. Reaction: Positive.

Case 7: Patient of Dr. J. McF. Winfield, Kings County Hospital. L. M., man, aged about 50 years, Russian. Advanced case of mixed type. Duration, about 20 years. Reaction: Positive.

Case 8: Patient of Dr. F. M. Dearborn, Metropolitan Hospital. P. L., Chinaman, aged 39 years. Advanced active case of mixed type. Duration, six years. Reaction: Positive.

Case 9: Patient of Dr. William S. Gottheil, City Hospital. Chinaman, aged 29 years. Moderate case of tubercular type, of four years' duration. Reaction: Weakly positive.

Case 10: Patient of Dr. William S. Gottheil, City Hospital. E. G., man, aged 27 years, born in Russia. Mild case of tubercular type. Duration, three and a half years. Reaction: Positive.

Case 11: Patient of Dr. L. Oulman, German Hospital. L. T., woman, aged 24 years, born in Russia. Case of mixed type of moderate severity. Duration, nine years. Reaction: Strongly positive.

Case 12: Colored woman, aged 57 years. Active tubercular case. Duration of disease, four years. Reaction: Positive.

Case 13: White woman, aged 48 years. Advanced case of mixed type. Duration, 14 years. Reaction: Positive.

Case 14: White woman, aged 27 years. Case of mixed type. Duration, seven years. Patient improving. Reaction: Weakly positive.

Case 15: White woman, aged 50 years. Mixed type of the disease in an advanced stage. Reaction: Positive.

Case 16: White woman, aged 40 years. Advanced and active case of mixed type. Reaction: Positive.

Case 17: Colored woman, aged 50 years. Advanced case of tubercular type. Duration of disease, three years. Reaction: Positive.

Case 18: White boy, aged 16 years. Case of tubercular type. Duration, nine years. Reaction: Positive.

Case 19: White man, aged 48 years. Incipient type, in which the disease is active. Duration, five years. Reaction: Strongly positive.

Case 20: White man, aged 45 years. Advanced case of mixed type. Duration, 17 years. Reaction: Positive.

Case 21: Colored man, aged 48 years. Advanced case of mixed type, in which process is stationary. Duration, four years. Reaction: Positive.

Case 22: Colored man, aged 37 years. Active case of tubercular type. Duration, five years. Reaction: Weakly positive.

Case 23: Colored man, aged 50 years. Advanced case of mixed type. Disease active. Duration, five years. Reaction: Strongly positive.

Case 24: White boy, aged 18 years. Terminal case of tubercular type, with active lesions. Duration, 12 years. Reaction: Positive.

Case 25: White boy, aged 19 years. Advanced case of mixed type. Duration, five years. Reaction: Positive.

Case 26: White boy, aged 16 years. Advanced case of mixed type. Duration, four years. Reaction: Positive.

Case 27: White boy, aged 20 years. Incipient case of mixed type, relapsing after apparent cure. Duration, nine years. Reaction: Strongly positive.

Case 28: Colored man, aged 42 years. Terminal stage of mixed type. Duration, three years. Reaction: Positive.

Case 29: White woman, aged 35 years. Advanced active case of mixed type. Duration, 14 years. Reaction: Positive.

Case 30: White woman, aged 57 years. Advanced case of mixed type, tubercles having disappeared. Duration, 20 years. Reaction: Positive.

Case 31: White man, aged 40 years. Terminal stage of mixed type. Duration, eight years. Reaction: Positive.

CASES OF TUBERCULAR AND MIXED TYPE WITH NEGATIVE REACTION.

Case 32: Patient of Dr. William S. Gottheil, City Hospital. H. S., man, aged 33 years, born in the United States. Case of mixed type of moderate severity. Duration, 10 years. Reaction: Negative.

Case 33: Patient of Dr. F. M. Dearborn, Metropolitan Hospital. J. M., man, aged 50 years, born in Russian Poland. Case of mixed type. Very few lesions at present, though formerly well marked. Duration of disease not known. Has been in leper ward for the past six years. Reaction: Negative.

Case 34: White man, aged 28 years. Mixed type. Patient improving. Duration of disease, 18 years. Reaction: Negative.

Case 35: White man, aged 21 years. Incipient case of mixed type, which is improving. Duration, six years. Reaction: Negative.

Case 36: White man, aged 24 years. Advanced case of mixed type. Disease active. Duration, 18 years. Reaction: Negative.

Case 37: Colored man, aged 26 years. Terminal case of mixed type. Duration, probably five years. Reaction: Negative.

Case 38: White woman, aged 43 years. Case of mixed type, improving, tubercles having disappeared. Duration, 20 years. Reaction: Negative.

CASES OF MACULO-ANESTHETIC TYPE WITH POSITIVE REACTION.

Case 39: Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. T. D., girl, born in Key West, Fla. Maculo-anesthetic case of one year's duration. Reaction: Positive.

Case 40: Colored woman, aged 64 years. Incipient anesthetic case. Duration, three years. Reaction: Strongly positive.

Case 41: Colored woman, aged 59 years. Maculo-anesthetic case, improving. Duration, two years. Reaction: Positive.

CASES OF MACULO-ANESTHETIC TYPE WITH NEGATIVE REACTION.

Case 42: Patient of Dr. J. McF. Winfield, Kings County Hospital. J. D., West Indian negro, aged 29 years. Maculo-anesthetic type. Duration, about 23 years. Reaction: Negative.

Case 43: White girl, aged 17 years. Incipient case of maculo-anesthetic type. Duration, 14 years. Reaction: Negative.

Case 44: White woman, aged about 60 years. Anesthetic type in advanced stage. Duration of the disease, unknown. Reaction: Negative.

Case 45: White woman about 50 years of age. Advanced case of anesthetic type. Duration of the disease, unknown. Reaction: Negative.

Case 46: White woman, aged about 50 years. Incipient maculo-anesthetic case. Duration unknown. Reaction: Negative.

Case 47: White woman, aged 87 years. Incipient case of maculo-anesthetic type. Duration, five years. Reaction: Negative.

Case 48: Colored woman, aged 53 years. Advanced anesthetic case. Duration, 27 years. Disease checked. Reaction: Negative.

Case 49: Colored woman, aged about 60 years. Advanced anesthetic case, the disease being stationary. Duration, 15 years. Reaction: Negative.

Case 50: White woman, aged 34 years. Maculo-anesthetic case. Former tubercles have disappeared. Duration, eight years. Reaction: Negative.

Case 51: White boy, aged 19 years. Advanced case of anesthetic type. Duration, nine years. Reaction: Negative.

Case 52: White man, aged 40 years. Maculo-anesthetic type, improving. Duration, 14 years. Reaction: Negative.

Case 53: White girl, aged 12 years. Incipient case of maculo-anesthetic type. Duration, four years. Reaction: Negative.

Case 54: Colored boy, aged 9 years. Incipient case of maculo-anesthetic type. Duration, four years. Reaction: Negative.

Case 55: White man, aged 43 years. Advanced case of anesthetic type. Duration, 30 years. Disease arrested. Reaction: Negative.

Case 56: White man, aged 54 years. Incipient case of anesthetic type. Duration, 10 years. Reaction: Negative.

Case 57: White man, aged 58 years. Terminal case of anesthetic type. Duration, 30 years. Reaction: Negative.

Case 58: White man, aged 56 years. Terminal stage of anesthetic type. Duration, 30 years. Reaction: Negative.

Case 59: Chinaman, aged 75 years. Anesthetic case of 13 years' duration. Reaction: Negative.

Case 60: White man, aged 46 years. Advanced anesthetic case. Patient claims to have been discharged cured from a Norwegian hospital 20 years ago. Duration, 25 years. Reaction: Negative.

CONCLUSIONS.

1. A positive Wassermann reaction is frequently obtained in cases of leprosy, giving no history or symptoms whatever of syphilis.
2. The reaction is at times very strong, inhibition of hemolysis being complete.
3. The reaction occurs chiefly in the tubercular and mixed forms of the disease, especially in advanced and active cases.
4. In the cases of the maculo-anesthetic and purely trophic type the reaction is generally negative.
5. The value of the test is not affected in the slightest by the results found in leprosy.

In closing, I desire to express my thanks to Dr. Isadore Dyer for kindly putting at my disposal the splendid material of the Louisiana Leper Home. I also wish to thank Dr. Ralph Hopkins, the attending physician to the Leper Home for aid in obtaining case histories. For the material in New York I am indebted to the physicians whose names have been mentioned in the text.

Symptomatology of Leprosy.

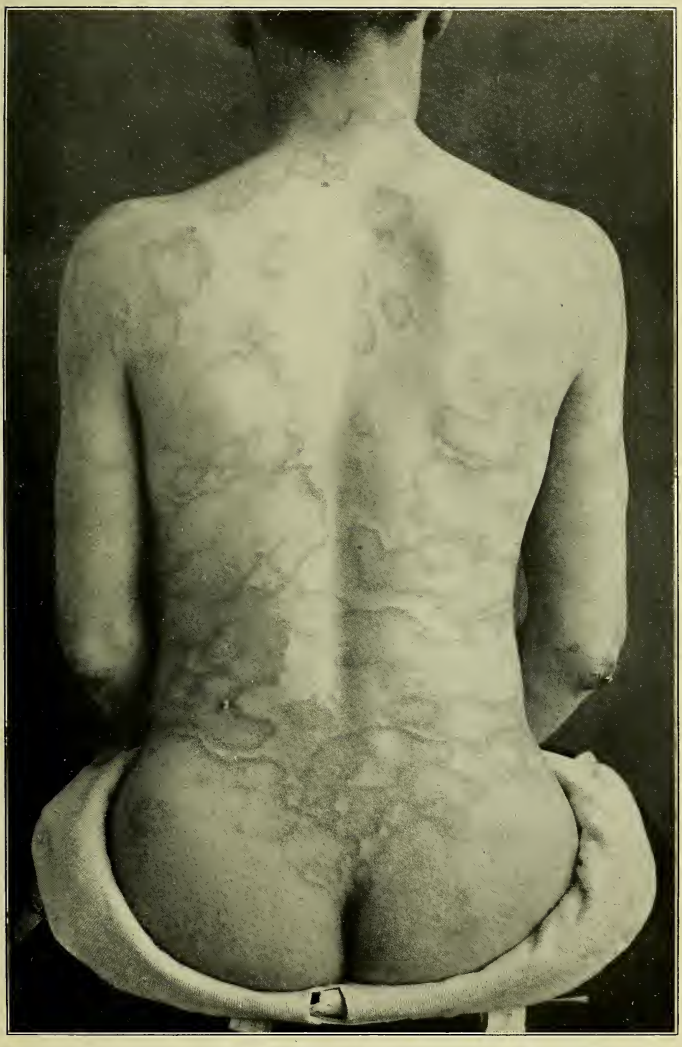
[By Howard Fox, M. D., of New York.]

As the number of lepers in New York City appears to be slowly but steadily increasing, it would seem that a knowledge of the symptoms of the disease is becoming of practical as well as of theoretical interest to the profession of this city.

In briefly presenting the numerous and varied symptoms of leprosy it is most convenient to describe the two distinct and classical types of the disease, namely, tubercular leprosy, in which the skin and mucous membranes are chiefly affected, and anæsthetic leprosy, in which the nervous system is principally involved. Macular leprosy is described by some writers as a third type of the disease, and in a few cases the macules constitute practically the only symptom. In most cases, however, they are simply forerunners of either the tubercular or anæsthetic stages and need not be discussed as a separate type of the disease. In a large number of the cases there is a combination of symptoms constituting what is called the mixed type of leprosy. Practically all of the cases seen in New York are of the tubercular or mixed type, the cases of pure nerve leprosy being extremely rare. Indeed, among 30 cases which I have seen in New York City during the past year I can recall having seen but one case of pure anæsthetic leprosy presenting well marked deformities or mutilations.

The symptoms of leprosy do not evolve with as much regularity as they do in syphilis for instance, and an artificial description of the stages of the disease seems hardly warranted. We do not know in what manner the infection occurs, as there is no primary lesion in leprosy that is comparable to the chancre of syphilis. It is therefore difficult or impossible to judge of the exact time when a certain patient has become infected. This may be estimated in certain cases in which, for instance, a person has resided for a short time in a leprous country and then returned to a nonleprous region and later presented the symptoms of leprosy.

The period elapsing between the time of infection and the first manifestations of the disease the so-called period of incubation, has no parallel as regards length of time with any other infectious disease. Thus it may vary from 3 months to 10, 20, or even 32 years, as in the case reported by Hallopeau.



CASE OF MACULAR LEPROSY IN A CAUCASIAN, SHOWING UNUSUAL CIRCINATE PATCHES.

The question as to whether the period of incubation represents a true germination of the bacilli, or only a long period of latency or hibernation, is one that need not be discussed at this point.

The general invasion of the body by the bacilli or their poisonous products may be marked by a group of symptoms or prodromata that are not in themselves in any way diagnostic of leprosy. They include a rise of temperature, which may be mild and gradual, or sudden and severe, as in pneumonia. The fever may be accompanied by general malaise, headache, vertigo, drowsiness, severe sweating, and various rheumatoid pains. The patient himself is apt to ascribe such symptoms to a "bad cold" or an attack of malaria. These symptoms may be followed in a few days by characteristic signs of leprosy, or the latter may not appear for many months, or even a year or more. It is, therefore, not remarkable that after a considerable lapse of time these early symptoms should have been entirely forgotten, especially by the more ignorant class of patients. As a matter of fact, there are numerous cases, especially of the anæsthetic type, in which the prodromal symptoms are entirely lacking.

A very early symptom which is observed in many cases, especially of the tubercular type, is a persistent rhinitis, with repeated mild attacks of epistaxis. This is thought by some to be as valuable a diagnostic sign as the hæmoptysis of early pulmonary tuberculosis. If, in addition, the bacilli can be demonstrated in the nasal secretion an early positive diagnosis can of course be made.

The onset of leprosy may be characterized by various sensory, vasomotor, and trophic disturbances that may or may not be associated with the prodromal symptoms. They include intermittent neuralgias of the legs, pruritus, hyperesthesia, profuse sweating, the symptoms of Raynaud's disease, etc. In a few cases a single isolated spot, comparable to an initial lesion, has been observed to have been the only symptoms of lepra for several years. In the great majority of cases the diagnosis of leprosy is not made or indeed the attention even directed to this disease until the appearance of the eruptive stage. This may occur within a few days, or perhaps years after the prodromata, or it may appear without any previous signs whatever.

The first eruption of leprosy may consist of congested erythematous patches that could hardly be considered as characteristic of the disease. On a recent visit to Cuba (where I had the opportunity of seeing 170 lepers), I saw a patient in the San Lazaro Hospital with an erythematous eruption that looked strikingly like an erythema multiforme. It certainly would never have suggested the diagnosis of leprosy to my mind. After a number of days or weeks the early erythematous eruption disappears and may reappear later, accompanied by fever and other general symptoms. After several repeated attacks in such a case the macules become permanent or "fixed," their color deepens and does not tend to disappear on pressure. In many cases, especially of the anæsthetic type, the macules make their appearance insidiously, without any constitutional symptoms, and are fixed and pigmented from the outset. In the majority of the cases, certainly as we see them in New York, the macules have become permanent by the time medical aid is sought.

The macules vary in size from a pea to that of the palm of the hand, or may occupy large areas of the body, especially in the anesthetic type. Their borders may be sharply or poorly defined. They may clear up in the center and form circinate lesions, or gyrate figures from a coalescence of several such rings. The serpiginous tendency is chiefly noted on the lower extremities. The centers of the macules may present a loss of pigmentation, while their borders are superpigmented, and sometimes upon the leprous patch a vitiligo develops in the shape of white and depressed disks. The macules may be hyperesthetic or itchy at the outset. Sooner or later they become anesthetic, the anesthesia being most marked in the center of the patches, while the superpigmented border is often, for a time at least, hyperesthetic. The macules are roughly symmetrical, the symmetry being more marked in the anesthetic type. The sites of predilection are the face, extensor aspects of the extremities, the buttocks, and the back. The lesions are very rare upon the palms and soles and are almost never seen upon the scalp. There is generally noticeable absence of sweating over the macules, and after considerable time there may be slight branny desquamation. While the macules may exist unchanged for many years they are usually followed sooner or later by the symptoms of tubercular or anesthetic leprosy, or a combination of both types.

The first appearance of tubercles and, indeed, the various crops of tubercles are often ushered in by febrile symptoms. In some cases they appear in-

sidiously without such general manifestations. They may appear in the form of diffuse flat infiltrations or as circumscribed nodules, varying from a small pea to a cherry or pigeon's egg in size. They are generally situated within the skin, although at times they may be beneath the skin, as in the shotlike nodules that may occur in the lobule of the ear. The tubercles may be engrafted upon or appear between the already existing macules. Their color varies from a light red, violaceous, or yellowish hue to a dark brown or reddish brown color. The surface of the tubercles is generally greasy from an excessive sebaceous secretion; it may be hyperesthetic or moderately anesthetic, and shows as a rule an absence of hairs. Indeed the falling of the eyebrows due to tubercular infiltration constitutes one of the earliest symptoms of nodular leprosy. The tubercles are found in the greatest number upon the face and the extensor aspect of the extremities. Upon the face they are chiefly noted upon the forehead, nose, chin, and ears, and their presence imparts a peculiar frowning or leonine expression to this form of the disease, which when once seen, can never be forgotten. For some unknown reason the scalp seems to enjoy a remarkable immunity to the ravages of leprosy, as it is never invaded by tubercles, and only in the rarest instances by macules. The palms and the soles are also very rarely the seat of tubercular infiltration. The tubercles are abundant upon the backs of the hands, elbows, knees, and about the ankles. As the last phalanx of the hand is spared for a time the infiltration of the first two phalanges gives the fingers a peculiar fusiform appearance. Upon the feet and ankles it is impossible to distinguish individual nodules, as the skin of this region is often the seat of a diffuse, hard edema, presenting the picture of true elephantiasis. The nails, especially of the fingers, are often spared for a considerable time.

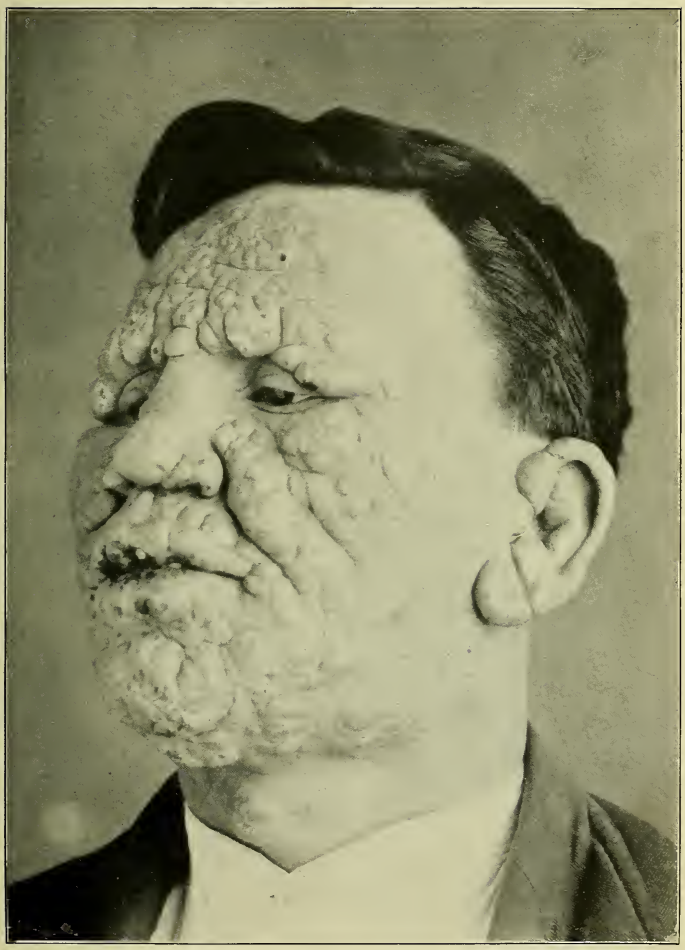
During the exacerbations of leprosy which are of frequent occurrence it is often noticed that the tubercles become reddened, swollen, and tender. At the end of these attacks some of the lesions are found to have decreased in size while new tubercles will have formed in other localities. The usual evolution of the tubercles is to slowly disappear by absorption leaving a deep stain or a slight cicatrix or to soften and ulcerate. In a few cases they undergo a fibrous transformation. Ulceration of the nodules occurs more frequently in tropical countries and among the more ignorant and uncleanly class of patients. The ulcerations cover large areas at times and encircle an entire limb. They eventually heal and leave apigmented scars that may be somewhat anesthetic and are generally surrounded by a superpigmented border.

The pharynx, palate, uvula, epiglottis, dorsum of the tongue and less often the mucous membrane of the mouth are sooner or later attacked by diffuse nodular infiltrations. These may persist for a time or become absorbed, ulcerate, or cicatrize. As a result of ulceration there is frequently distortion of the epiglottis or uvula. Perforation of the palate is very unusual. Later the interior of the larynx and even the trachea may be invaded by the leprous deposits. A peculiar pallor is shown by the mucous membrane of the larynx and pharynx. One of the earliest symptoms of leprosy is a change in the voice, which may at first be slightly hoarse and later becomes harsh, sibilant, or whispering, and often interrupted by attacks of dyspnea.

The visual apparatus is frequently involved in tubercular leprosy. The lesions involve the anterior segment of the globe, especially the sclerocorneal junction and the ciliary region. There may be a keratitis which gradually invades the entire cornea, or a tubercle may form at the limbus and penetrate into the anterior chamber and destroy vision. Iritis is also common and is most frequently of plastic type.

The inguinal glands and less often the axillary and cervical glands are enlarged in tubercular leprosy and increase in size during the exacerbations of the disease. They are not as firm as the glands of syphilis and do not suppurate in the latest stages of the disease.

The urine often contains albumin and casts but no lepra bacilli, the changes in the kidney being due to an ordinary nonleprous nephritis. While the bacilli are as a rule disseminated in the internal organs, especially the liver, spleen, and bone marrow, they do not produce any characteristic symptoms except at times an enlargement of the spleen or possibly of the liver. A double epididymoorchitis is fairly common and presents a compact mass with smooth or nodular surface, with or without any accompanying hydrocele. In the rare cases in which fistulæ form, there is probably a secondary infection from the tubercle bacillus. In the majority of cases the disease causes a diminution of sexual power and desire. In women the menses become irregular and finally cease. In the case of young girls this function is not established at all.



NODULAR LEPROSY OF THREE YEARS' DURATION IN A CAUCASIAN.

Among other symptoms of tubercular leprosy should be mentioned a general darkening of the skin, a dusky cyanosis of the fingers, the appearance of occasional flaccid bullæ, and enlargement of the ulnar nerve.

The course of tubercular leprosy is in most cases chronic, the average duration of life being about from 8 to 10 years. The most favorable termination of the form of the disease is a change to the anesthetic type in which case the symptoms ameliorate and the patient's life is often considerably prolonged. The tubercular leper in the terminal stages of his affliction is indeed an object of pity. The face is distorted by a mass of tubercles, many of them are covered with crusts and ulcers. There is a foul discharge from the nose and general fœtid odor from the lungs and skin. The voice is lost, sight is destroyed, and of the special senses hearing alone remains. The patient is extremely cachectic and weak and suffers from continual diarrhea, and is robbed of his sleep by intense neuralgic pains. In spite of such a terrible condition the mind of the leper remains practically unaffected up to the time of his death, which is generally due to marasmus, diarrhea, stenosis of the larynx, or an intercurrent disease or complication such as pneumonia or pulmonary tuberculosis.

The onset of anesthetic leprosy may be accompanied by febrile symptoms as in the tubercular type. It is, however, more apt to appear insidiously and make itself manifest by a macular or bullous eruption or by various disturbances of sensation. The macules, according to Impey, are not due to the presence of bacilli in the skin but to vasomotor action on the terminal branches of the cutaneous nerves. The same is probably true of the bullous eruption in which the lesions are as a rule free from lepra bacilli. "While the cutaneous eruption in nerve leprosy," writes Morrow, "is not so essentially a part of the morbid process as in tubercular leprosy, the macules exhibit a greater variety of aspect, especially in their configuration and coloring." They are more apt to persist and to clear up in the center and form vitiligoid patches, especially in the dark-skinned races. The hairs upon the macules do not fall, but are more apt to become white.

The bullous eruption is more often encountered in the early stage of the disease, the lesions varying in size from a split pea to a cherry. They may appear upon any part of the body except the scalp, but are seen upon the hands, elbows, knees, ankles, and also the palms and soles. The bullæ soon rupture, dry, and form crusts followed by cicatrices.

The symptoms in general of the anesthetic type are those of a peripheral neuritis, causing various sensory and trophic manifestations. In contrast with the tubercular type of the disease, which is characterized, as von Bergmann says, by marked hyperplasia, the noticeable changes in anesthetic leprosy are those of atrophy.

One of the most important and diagnostic symptoms is an increase in the size of some of the nerve trunks that occurs at a very early period of the disease. The greatest changes are observed in the nerves that are superficially situated, such as the ulnar and median nerves. They are changed to cylindrical or fusiform or beaded cords, and may at times attain the thickness of the little finger. The ulnar enlargement is especially characteristic and may at times be felt in its entire course from the elbow to the axilla. At the outset the nerve trunks are painful upon pressure, but later become completely insensible to pain.

The disturbances of sensation in leprosy may be confined to the macules or exist independently of them. The characteristic anesthesia, which represents a complete disorganization of a nerve trunk, is invariably preceded by irritative symptoms. There is often hyperesthesia, which may be intense, or there may be pruritiis, neuralgic, or shooting pains, or various forms of paresthesia. There may be vasomotor symptoms, such as cyanosis, or secretory disturbances, such as interference with sweat secretion.

Sooner or later anesthesia makes its appearance, and is especially marked in the extremities. It is first noticed in the fingers and toes and then travels upward toward the trunk. It is often bandlike at first, but later involves the entire circumference of a limb. Part of the area of anesthesia is fixed, while the rest, according to Jeanselme, varies in intensity from day to day. There is often dissociation of sensation, that of temperature and pain disappearing, for instance, while the sensation of touch remains. Sensation may also be delayed, as when the prick of a pin is felt after an interval of several seconds. The anesthesia becomes complete at last, so that the patient may be able to cut off portions of the hands or feet without experiencing the slightest pain.

Muscular atrophy is one of the constant and striking symptoms of anesthetic leprosy. There is a diminution in force in proportion to the waste of muscle

tissue. At times there is a true paralysis. Atrophy is noted at an early stage in the thenar and hypothenar regions. From atrophy of the first dorsal interosseous a characteristic hollowing of the back of the hand is produced. One of the commonest deformities is the "leper claw" produced by tendinous retractions and muscular atrophy. It is formed by extension of the first and a flexion of the second and third phalanges. The palm is flattened and the thumb is on the same plane with the fingers. In spite of this deformity the use of the hands is far from being lost, especially if the sensation of touch remains.

The superficial muscles of the face are frequently atrophied and can give the patient an appearance that is as characteristic as the leonine face of the tubercular leper. The eyes have a peculiar stare and the lids can not be closed. The lips are flaccid and pronunciation of labials is difficult. On account of eversion of the lower lip saliva may flow from the mouth. The face becomes an expressionless mask, and the patient's appearance is stupid and doleful.

In some cases the process of anesthetic leprosy does not go beyond the production of muscular atrophy and tendinous retraction. In other cases, where the disturbance of nutrition is very great, there are bone changes which give rise to frightful mutilations. The loss of bone may occur from necrosis or from a process of interstitial absorption. In the case of the fingers the second phalanx is apt to be the first to disappear, so that the fingers appear to have only two phalanges. In some cases the nails are preserved with remarkable tenacity in spite of extensive loss of bone. Finally, the hands and feet become veritable stumps, the shape of the feet being compared to that of a pestle or drumstick. Large trophic ulcers, among them the so-called perforating ulcers, may add to the patient's distress.

The mucous membranes are much less often involved in the anesthetic than in the tubercular type of leprosy. As the lower lid is everted the conjunctiva is unprotected and soon becomes inflamed. Corneal opacities may form and destroy the sight. Ulceration and destruction of the septum, with consequent sinking of the nose, is not uncommon. Due to loss of tactile sensation, there is often difficulty in swallowing, the food being regurgitated into the nostrils.

The course of anesthetic leprosy is decidedly chronic, the average duration of life being about 15 years. In some cases the process appears to come to a standstill and the patient is apparently cured. A number of such cases have been reported by Dyer, of New Orleans. In a few cases the anesthetic type changes to the tubercular form of the disease.

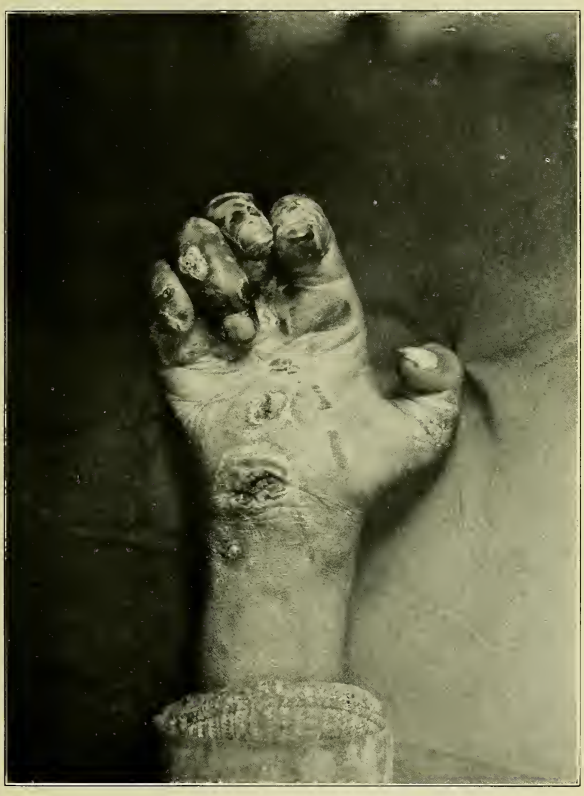
The termination of a severe case of anesthetic leprosy presents a totally different picture from that of the tubercular type, but one that may be equally pitiful and distressing. The anesthetic leper is emaciated and cachectic. He is bedridden and has to be fed by attendants. The nose is sunken, the sight is extinguished, and saliva pours from the paralyzed lips. The patient suffers from a sense of cold, loss of appetite, insatiable thirst, and severe neuralgic pains. The numerous ulcerations add to the natural disagreeable odor of the leper and the deformities of the limbs make them scarcely recognizable as those of a human being. The patient's mind is dull, but by no means lost. Death is generally due to marasmus, amyloid degeneration of the viscera, diarrhea, or to an intercurrent disease. It is rarely due to pulmonary tuberculosis.

The CHAIRMAN. We are very much obliged to you, Doctor. The committee will next hear Dr. Bracken, of Minnesota.

STATEMENT OF DR. HENRY M. BRACKEN, SECRETARY OF THE STATE BOARD OF HEALTH OF MINNESOTA.

The CHAIRMAN. Doctor, just proceed in your own way, giving your ideas about this bill.

Dr. BRACKEN. To begin with, Mr. Chairman, I wish to state that I am most heartily in favor of the bill, and that the various State health officers have been arguing for such a bill for years. I know that efforts have been made to secure a national leprosarium since 1898. The Conference of State and Provincial Boards of Health has had this subject before it for years, and has at various times



ANAESTHETIC LEPROSY IN A CAUCASIAN SHOWING "CLAW HAND" AND ULCERATION.

passed resolutions urging that such an institution or institutions be provided. The subject has also come up from time to time at the Conferences of State and Territorial Health Officers, which the Surgeon General of the United States Public Health Service is required by law to call yearly.

The CHAIRMAN. Why do we need it?

Dr. BRACKEN. Because this is a problem that the States can not solve. In many of the States the lepers found do not belong to the State. For example, Dr. G. A. Hanson, of Bergen, Norway, reported in 1888 that about 160 lepers had migrated into three States—Wisconsin, Iowa, and Minnesota. At the time that he wrote probably not more than 20 of these 160 lepers were still alive. Dr. Hanson further states: "The number of immigrated lepers from Norway is much greater than I had any idea of from the knowledge we could gather at home. My friends have given me the names of many lepers here in America whom we did not know to be lepers when they left Norway." It is true that the United States quarantine regulations exclude known lepers, but leprosy may lie dormant for a considerable length of time. Hence people may enter the United States and live here a considerable time before discoverable symptoms of leprosy appear. The Federal quarantine regulations can not prevent such lepers entering the country.

A record of lepers has been kept in Minnesota since 1888, and the record for the total 83 is as follows:

Disease present at time of entry	32
Symptoms appearing 1 year after entry	2
Symptoms appearing 2 years after entry	2
Symptoms appearing 3 years after entry	4
Symptoms appearing 4 years after entry	3
Symptoms appearing 5 years after entry	1
Symptoms appearing 6 years after entry	1
Symptoms appearing 7 years after entry	3
Symptoms appearing 8 years after entry	4
Symptoms appearing 9 years after entry	3
Symptoms appearing 10 years after entry	2
Symptoms appearing 11 years after entry	1
Symptoms appearing 12 years after entry	0
Symptoms appearing 13 years after entry	3
Symptoms appearing over 13 years after entry	8
Not stated	8
Born in United States	6

It would appear, therefore, that of the 73 lepers coming into Minnesota from foreign countries (for they were all foreigners), 41 of them developed symptoms after they came to America. It is true that the symptoms may have been present in possibly 11 of these at the time of entry, but if so they were unnoticeable (at least so reported) by the lepers or their friends and unrecognized by the port quarantine inspectors.

There are now living in Minnesota eight known lepers. Three of these were born in Minnesota, hence State cases, but born of foreign parents; hence they received their infection from foreign sources.

Leprosy is not easily recognized; first, because the leper may not come under medical observation until the disease is well advanced, and it is therefore a mere accident if the case is discovered; and, second, because the physicians in general see so few cases of leprosy

that when it appears they are very apt to class it as some other disease until it is so far advanced that it is easily recognized.

Still further, those afflicted with leprosy seldom recover. The disease being, therefore, one that remains with the individual for the rest of life, becoming gradually worse and worse, the individual becomes an outcast in many instances and wanders from State to State.

It is impossible for any one State to take charge of and keep these wandering lepers. All of the arguments point to the necessity of Federal care for the leper, but there is still another point. Few States have a sufficient number of lepers to justify the construction of a proper building where such patients can be cared for in a humane way and given such treatment as may possibly result in recovery. It is a well-recognized fact that a certain percentage of lepers will recover if they are properly cared for. Such treatment is not given to the lepers in the United States, for, as far as I know, but two States have made any provision for the proper care of their lepers, namely, Louisiana and Massachusetts.

Senator Works. Have you any provision in Minnesota for taking care of lepers?

Dr. Bracken. No. The health unit in Minnesota is the township. It is impossible for any township properly to care for a leper found resident in such district, and, further, it is impossible for the township to transfer the responsibility for the proper housing and care of such an individual to the State. The county may aid in the proper control of the case, but this is not a satisfactory means of caring for the leper.

The Chairman. What is the method of taking care of a leper when found?

Dr. Bracken. When a leper is found, the health authorities of the district in which the leper lives are notified. The leper is isolated at home if possible. If the leper has a home he or she is isolated in the home. If the leper is a pauper the question then becomes exceedingly difficult to handle. If the leper is isolated at home the leper, the members of the family, and the local health authorities are notified as to what shall be done in order to prevent the spread of infection to others. In some instances the leper leads a quiet home life without annoyance. In others life is made unendurable not only for the leper but for the entire family, for in many instances the entire family is ostracized.

Senator Works. How many lepers have you in your State?

Dr. Bracken. So far as I know, there are eight living lepers.

Senator Works. Is this division of responsibility in health matters in your State made so by law, or by the rules and regulations of your State board of health?

Dr. Bracken. By the State law. The State board of health is given advisory jurisdiction but we have no authority over these individual cases. We can only advise the local health authorities what to do.

Senator Smoot. I suppose it is the same as in my State. The disease develops and the city authorities take charge of it, if they can handle it; but if the burden is too big the city has a right to ask the county in which the city is located to take charge of the case.

Dr. BRACKEN. In Minnesota that depends partly on the method of caring for paupers. If this is on the county plan, then the actual housing, feeding, and clothing of the leper may be transferred to the county. But in many sections of our State paupers are cared for on the township plan, and then the burden of caring for the individual, both as a pauper and a leper, rests upon the township with the possibility of recovering part of the expense from the county.

As an illustration of this feature in Minnesota, at present we have a poor woman, a leper, the mother of several children, and having a shiftless husband. These people live as paupers. The father of this woman, a Norwegian, died in Minnesota some years ago. Later a brother died. The father and brother both lived and died in the same house. This woman, when she was found to be a leper, lived in a township adjoining that in which her father and brother had lived. Naturally she should have been returned to the old home, but the township officials of the township in which this home was located objected to her being returned. Therefore she continues to live in a township in which she does not really belong, but where they are practically living as squatters in an abandoned old farmhouse, supported in part by the township and in part by the county.

The CHAIRMAN. Is this woman who is still living in your State under confinement?

Dr. BRACKEN. No; there is no danger of her infecting any outside of her own family; but while she is given advice as to how she should live to prevent the infection of her children, it is almost impossible for her so to live. She, of course, can not leave the home, but her children have not been separated from her.

The CHAIRMAN. Do you regard this as very dangerous—for the children to be living with her?

Dr. BRACKEN. I certainly do.

Senator SMOOT. Do you have a provision for handling smallpox cases?

Dr. BRACKEN. Certainly. We can control those ill with smallpox; but, as you know, these patients quickly recover, and this is a comparatively easy matter. We can not make proper provision for caring for the few lepers in our State during the remainder of their lives. The possibility of segregating this woman in the township where she lives for the rest of her life does not exist under present conditions.

Senator WORKS. It looks as if you were asking the Government to do what your State ought to do.

Dr. BRACKEN. Hardly. If foreign lepers had been shut out of the United States, Minnesota would never have had any lepers to take care of, for all of the American-born lepers which we have had in Minnesota have received their infection from foreign lepers which came into this country.

The CHAIRMAN. How does the profession generally in your State feel toward the enactment of such a measure as this, Doctor?

Dr. BRACKEN. The profession there is strongly in favor of such an institution.

The CHAIRMAN. Do you know of any opposition?

Dr. BRACKEN. None whatever.

Senator SMOOT. Many of the people in your State don't know anything about it, do they?

Dr. BRACKEN. Yes; many of them are familiar with conditions.

Senator SMOOT. The matter has not been very public.

Dr. BRACKEN. No.

Senator WORKS. You are not able to find any objection on the part of the people of your State to having the National Government take care of these people whom the State itself ought to handle?

Dr. BRACKEN. That is not the point.

Senator WORKS. That is one point.

Dr. BRACKEN. The real question is with regard to giving the patient proper relief.

Senator SMOOT. In the case of leprosy, when death comes it is a relief.

The CHAIRMAN. Leprosy is also a menace to the public health when a case breaks out?

Dr. BRACKEN. Yes.

The CHAIRMAN. Is it generally considered by your profession that such a bill as this would be desirable?

Dr. BRACKEN. It is.

The CHAIRMAN. Are there any further questions? If not, we will excuse Dr. Bracken. We are very much obliged to you, Doctor.

We will next hear from Dr. Parker, of Massachusetts.

STATEMENT OF DR. FRANK H. PARKER, SUPERINTENDENT OF THE STATE LEPER COLONY OF MASSACHUSETTS.

The CHAIRMAN. State what position you occupy, Doctor.

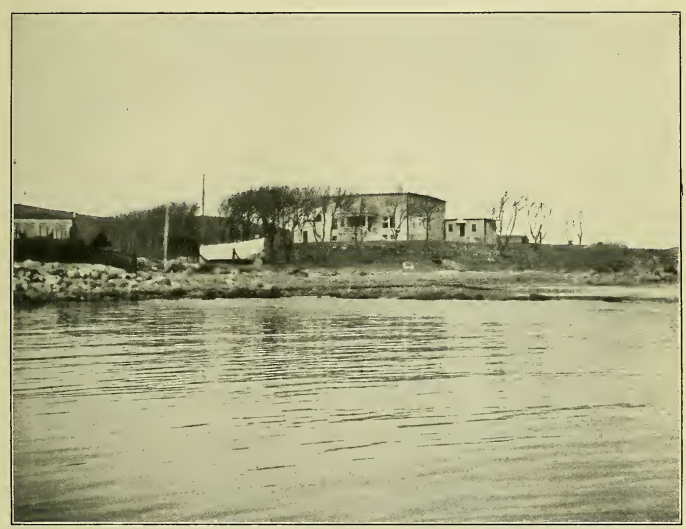
Dr. PARKER. Superintendent of the State leper colony of Massachusetts.

Senator BECKHAM. I judge from the title of the institution that the lepers there work.

Dr. PARKER. Only what they wish to do. There is no compulsion whatever. Some have their gardens, and we encourage them all, if able, to do something. We pay two of the Chinese patients for doing the laundry work for the other patients.

The CHAIRMAN. Will you describe your colony and your method of work and give your idea of the necessity of a bill of this kind? Tell us how many patients you have, and so on.

Dr. PARKER. Commencing with our leper history in Massachusetts, we have no authentic record of any lepers previous to 1882. Since then we have had 30 cases, representing 11 different nationalities, namely, 4 Chinese, 1 Japanese, 1 Swede, 3 British West Indians, 6 Cape de Verde Islanders, 2 Russian (Lettieh), 4 Russians (Hebrews), 2 Greeks, 1 Italian, 1 Syrian, 4 Americans, and 1 unknown. There were 23 males, 6 females, and 1 unknown; 15 were single, 9 married, 1 widow, and 1 widower. In 4 the civil status was unknown. Nine were known to have children with whom they had been living since the onset of the disease. Three were mariners or in some form followers of the sea, 6 were outdoor laborers, 3 laundrymen, 2 cooks, 1 painter, 1 brush maker, 1 factory hand, 2 clerks, 1 dishwasher, 3 housewives, 2 domestics, 1 student, and 1 teacher. The occupation of 3 was not ascertained.



ADMINISTRATION BUILDING, MASSACHUSETTS LEPER COLONY.

In 3 of these cases the disease took the anaesthetic form, in 2 the type would be most accurately defined as "mixed," and 23 cases exhibited the tubercular form; in 2 of the early cases the record fails to show the form of the disease. With the exception of one case, the history of which is unknown, these patients were either immigrants or showed a history of travel and sojourn in foreign countries or districts where leprosy is more or less prevalent.

Senator SMOOT. How many have you to-day?

Dr. PARKER. We have 11 at the present time. Previous to the establishment of our leper colony, which took place in 1905, the lepers were sent to Gallops Island in Boston Harbor, a quarantine station. There they usually rounded out their existence, although we have a record of one or two who escaped. In 1905, by the enactment of State law, money was appropriated for the establishment of a leper colony. We had some little trouble in locating such an institution. At first it was thought preferable to have it on the mainland. The State purchased a farm with that idea in view. There was such a tremendous wail went forth that possibly the largest hearing ever had upon so small a question—if this question can be called a small one—was held, protesting against the site which the State had purchased. So strong was the protest that the project had to be abandoned, so far as that location was concerned, the people agreeing to buy the property back from the State, paying dollar for dollar or more, if necessary, for all that had been expended there. Then we had to look further, and we went to sea. Finally we located the colony on Penikese Island in Buzzards Bay, where we acquired the property by right of eminent domain. The State paid for that site the sum of $25,000.

Since that time considerably larger amounts have been expended upon it in the improvements, etc.

Senator SMOOT. How much have you spent altogether?

Dr. PARKER. We have spent on leprosy in the State of Massachusetts, since 1905, $265,000.

Senator SMOOT. What are your improvements worth?

Dr. PARKER. We have spent from $75,000 to $85,000 in improvements. We built six cottages, each containing six rooms, including bathroom, hot and cold water, open plumbing, each intended for two occupants. Later two of these cottages were united, forming the hospital. This building contains two wards of five rooms each, billiard room, a large living room, a general dining room, large kitchen, five bathrooms, a private suite of four rooms for the nurses, and chambers for the matron, steward, and other help. An administration building, an electric-light plant, a refrigeration and ice-making plant, a steam laundry, and many minor improvements. Two water systems, one fresh and one salt, supply all of the houses.

While we do not make any boasts of having an elaborate plant, we do contend that we have a very comfortable one, with most of the modern improvements and conveniencies to make life pleasant for our patients and those who minister to them.

Senator SMOOT. In other words, you have spent about $200,000 for 11 patients.

Dr. PARKER. This represents what we have spent on all of the patients since its institution—24 in all.

Senator SMOOT. This bill provides for $250,000 for taking care of all the lepers in the United States, which amount to something like 1,000. Do you think it is possible to provide for the sum of $250,000 sufficient accommodations to take care of 500 to 1,000 patients?

Dr. PARKER. Not at the ratio we have spent in Massachusetts for our 24 patients.

The CHAIRMAN. You said you spent that much?

Dr. PARKER. Since we began.

The CHAIRMAN. That is the annual maintenance charge and salaries, etc., since you began?

Dr. PARKER. Yes, sir.

Senator SMOOT. What is your average annual maintenance charge?

Dr. PARKER. Possibly about $15,000, although for the past two years it has been $28,000.

Senator SMOOT. In eight years that would take up all the money that has been spent.

Dr. PARKER. At the start our maintenance was very small, but each year we have added to our plant, and with the improvements has naturally come an added cost of maintenance. We have to employ help from the outside and we are obliged to pay somewhat larger salaries than in similar positions elsewhere.

Senator WORKS. What is the highest number of patients you have had?

Dr. PARKER. Eighteen at one time; several have died and three have been deported. We have had 24 in all.

Senator WORKS. It costs the State $2,700 for each patient?

Dr. PARKER. Nearer $2,500, or about $49 a week.

The CHAIRMAN. Since you began?

Dr. PARKER. No, sir; that is what it is costing at the present time. With our added improvements our expenses increase, and our overhead expenses and care of the island are about as heavy as though we had 50 or more patients.

Senator SMOOT. Not since you began?

Dr. PARKER. It was much less than that in the beginning. We commenced quite unassumingly and have gradually developed our present plant.

Senator SMOOT. The annual appropriation for the colony is about $28,000?

Dr. PARKER. That is what it has been the last two or three years.

Senator SMOOT. That would be $2,600 to $2,700 per patient at the present time?

Dr. PARKER. Yes; about that at the present time.

Senator SMOOT. Per annum?

Dr. PARKER. Yes, sir.

Senator BECKHAM. Have any cures been effected?

Dr. PARKER. We can hardly claim positive cures, yet two have been so far relieved that their release was recommended, as they were no longer in a condition to be a menace to the public health.

One, a Chinaman, availed himself of the privilege and returned to China, the other has not as yet left Penikese.

In one case, through the influence of friends and by the enactment of a State law which provides for the discharge of patients under certain conditions, the patient was removed, to be cared for by friends

in New York State. This was done with the consent of the authorities of that State.

Senator SMOOT. Were these two who were discharged actually cured, or were there still the elements of leprosy in their system?

Dr. PARKER. We could find no positive evidences of any presence of the disease in the system by microscopic examinations, which we thought quite thorough. We would not want to say there was not some nidus of infection that might make itself manifest at some future time.

The CHAIRMAN. Can you tell positively by tests whether a man has leprosy or not?

Dr. PARKER. If we can find the presence of the lepra bacilli, we have positive proof of it.

The CHAIRMAN. If you do not find the lepra bacilli, do you say he is cured?

Dr. PARKER. A person once having had the disease, I would not want to say positively until a number of years had passed without any recurrence of symptoms, and they had proven themselves microscopically negative. We have never sent any cases to Penikese Island without first finding the lepra bacillus. We maintain there quite a complete research laboratory to help us in our experience.

The CHAIRMAN. Have you been using chaulmoogra oil or have you had other remedies?

Dr. PARKER. We have used that from the beginning. We have used everything that is on record as giving relief, and in most every way. Not every patient can assimilate the large doses of the oil that are required to produce the desired effect. It becomes repulsive to them and they often refuse to take it. We are at the present time using Dr. Heiser's method of administering the oil, although we have not carried it far enough or long enough as yet to see much result. But we anticipate good results in view of the good work Dr. Heiser has done. At one time we imported Leproline, an Indian remedy, but the result of its use did not warrant its continuance.

The CHAIRMAN. Do your patients go to you voluntarily, or are they sent?

Dr. PARKER. The health authorities send them. It is compulsory by the State laws; yet many of them have come willingly.

The CHAIRMAN. Are the doctors of the State required to notify the authorities whenever a case develops?

Dr. PARKER. Yes, sir.

The CHAIRMAN. How does the profession of your State feel toward the enactment of some such law as that contemplated in the bill?

Dr. PARKER. In regard to the profession in general, I do not know that I can answer intelligently, because they know we have a State hospital for such cases, but the taxpayers would like, of course, to have the Government assume the responsibility, although we would not want it done unless it was going to be for the betterment of our patients.

The CHAIRMAN. How do you feel about such a law yourself?

Dr. PARKER. As for our own State, I feel we are doing fairly well as it is, but on the part of the people at large I should say they would like to change simply more on account of the expense. It is quite heavy for us for the few patients we have. At the same time

I wish to go on record for the State of Massachusetts as being in favor of the bill if it means better care and more humane treatment.

Senator SMOOT. There are States where no provision is made, and other States where the facilities are altogether inadequate. The question is whether the Government should do for the States what the States ought to do themselves, as your State has done and as they have done in the State of Louisiana.

Senator BECKHAM. If the people of Massachusetts can do as they have done at considerable expense and take good care of the lepers, are the people of Massachusetts thereby secure from the dangers of that disease from other States when such other States have not taken similar steps?

Dr. PARKER. Not as much as we ought to be, yet the State with no laws governing the situation or are lax in the enforcement of such as they may have suffer the most, as such States form tempting places of abode. These people naturally shun and avoid those places where the laws are stringent and enforced.

From our standpoint all of the States should have laws governing the situation or the National Government, whichever is deemed the wisest and best. One or the other condition should prevail, as the only possible way to handle the problem properly is by segregation.

Senator BECKHAM. It would be necessary for every State uniformly to deal with the question and take care of the cases in that State, would it not?

Dr. PARKER. There should be uniformity; yes, sir, to insure success.

Senator BECKHAM. Is it likely or possible to have uniformity?

Dr. PARKER. Not at the present time with so many States indifferent.

Senator WORKS. Are there a good many States where the patients are not segregated at all?

Dr. PARKER. Yes, sir.

Senator WEEKS. How many States?

Dr. PARKER. Probably 24 or 25; possibly more.

Senator WEEKS. Have you taken them from any other States to care for in your institution?

Dr. PARKER. No, sir.

Senator WEEKS. Have you had any requests to do so?

Dr. PARKER. Yes, sir.

Senator WEEKS. Is there any hospital in New England to care for them?

Dr. PARKER. Only that in Massachusetts.

Senator WEEKS. What would be the objection to taking cases from other New England States?

Dr. PARKER. Under the State laws, we can not. The moment we take them over the border line into the State of Massachusetts they become a State charge, and we can not claim anything from the other State for maintenance. I suppose the only thing to do would be for the States interested to enter into a contract, and that would mean a contract made between the governments of the States interested, and not between the local authorities.

Senator WEEKS. Have other cases appeared in New England?

Dr. PARKER. Yes, sir.

Senator WEEKS. What has been done with them?

Dr. PARKER. They have been taken care of in those States where they occurred.

Senator WEEKS. Why can not a contract be made, such as you suggest? Do the laws prohibit such a contract?

Dr. PARKER. No, sir; the laws do not prohibit such a contract, so far as I know, but the parties interested have never gone that far.

Senator WEEKS. It would reduce your per capita expense if you had the privilege of taking in patients from other States, would it not?

Dr. PARKER. Surely.

Senator WEEKS. How large is this island?

Dr. PARKER. In the neighborhood of 100 acres.

Senator WEEKS. How many patients could be accommodated there if you had buildings constructed on the space available?

Dr. PARKER. I imagine we could easily take care of 50 to 100 cases, with the proper facilities. The patients at the present time have the run of two-thirds of the island, and there must be plenty of room for them.

Senator WEEKS. What room do they need?

Dr. PARKER. Simply for them to exercise and large enough to roam about somewhat; they do not like the thought that they are prisoners. They enjoy that freedom which a large space engenders.

Senator WEEKS. On 65 acres, I think you could accommodate a great deal more than 20.

Dr. PARKER. We can, but we have accommodations at present for only 20, or possibly a few more if it was urgent at short notice.

The CHAIRMAN. Do you think the Commonwealth of Massachusetts will pass a law permitting you to take care of lepers from other States?

Dr. PARKER. It might, possibly, if the proposition was advantageously presented to the legislature.

The CHAIRMAN. I heard that John Early had sought admission to your home. Is that a fact?

Dr. PARKER. I can not say that he has applied directly; no. I have had some correspondence with Mr. Early, but never in the sense of his applying for admission to the institution.

The CHAIRMAN. Perhaps I misunderstood.

Senator WEEKS. Concerning the danger of disease coming from other States, have you been able to determine if any of your patients have come from other States?

Dr. PARKER. No, sir; not directly; the most of our patients are foreigners who landed in Massachusetts. Our little community is quite cosmopolitan.

Senator BECKHAM. As long as these other States do not segregate their lepers there will be that danger, will there not?

Dr. PARKER. Of course there is a certain amount of danger from that source.

Senator WEEKS. Do you see any objection in a bill of this kind, if it were passed and the Government established a hospital for lepers, to having the States pay their proportional cost of conducting the hospital, based on the number of patients sent there, and each State being compelled to send them to such hospital?

Dr. PARKER. Possibly that would be outside of my province to answer. The State legislature would want to answer that question. Personally, it seems fair and equitable.

Senator WEEKS. Without reference to the question of objection to the location of such an institution, suppose the institution were established, do you think there would be anything in the way of requiring the State of New Hampshire, for instance, if a case developed there, to send that leper to the national institution and be required to pay its proportional share of the cost of maintaining the institution?

Dr. PARKER. Possibly not. I do not see why each State should not pay for the care of its dependents wherever they are.

Senator WEEKS. I do not see why they should not, either.

Dr. PARKER. In Massachusetts the law provides along that line. If a dependent person, for instance, is ill in Boston, where he is taken care of, and the person lives in Springfield and has an established settlement there, Springfield must pay for the care given him. This illustrates the same idea. I should think it would apply interstate as well as intrastate.

Senator WEEKS. It is the same principle.

Dr. PARKER. Yes, sir.

The CHAIRMAN. Have you been able to work out to your own satisfaction how this disease is communicated?

Dr. PARKER. No, sir; we know it is due to a germ—the lepra bacillus—and if anybody could solve the method of conveyance it would be a great boon to mankind. We would all be very grateful to him.

The CHAIRMAN. Are there any further questions? If, not, Dr. Parker will be excused.

Dr. PARKER. Thank you.

The CHAIRMAN. We are very much obliged to you, Doctor. We will now hear from Dr. Engman, of Missouri.

STATEMENT OF DR. MARTIN F. ENGMAN, PROFESSOR OF SKIN DISEASES IN WASHINGTON UNIVERSITY, ST. LOUIS, MO.

The CHAIRMAN. What is your position—your official position?

Dr. ENGMAN. I am professor of skin diseases in Washington University, in St. Louis, Mo., and president of the medical board of the Barnard Free Skin and Cancer Hospital, St. Louis.

The CHAIRMAN. Have you made a special study of lepers and of leprosy?

Dr. ENGMAN. Leprosy is one of the diseases included in my specialty; therefore I may say I have made special study of it. I have seen lepers for the last 20 years in this country and in Europe, and have made some studies upon the disease with Prof. Unna, of Hamburg, Germany. I can not say I have made a specialty of leprosy, but the mystery, the historical interest, and the social menace in the disease have particularly attracted my attention for a good many years.

The CHAIRMAN. Are there several cases of leprosy in your State?

Dr. ENGMAN. Yes, sir; we have been seeing leprosy there for a good many years. I have been in St. Louis, occupied in the practice

of medicine, for 19 years, and have quite frequently encountered the disease.

The CHAIRMAN. Can you give us some idea of about how many cases there have been?

Dr. ENGMAN. No, sir; I could not. It would be impossible for me to tell you how many cases have occurred in St. Louis during that time. In my own personal experience in the last 15 years I have seen in public and private practice at least 15 lepers, and I have known of other cases of leprosy seen by my colleagues.

The necessity of a national leprosarium appeals to me in a very dramatic way. In the summer of 1913 there appeared at my clinic at Washington University a young man, probably 35, American born, with a skin disease which had appeared a few weeks' previous to his visit. He was married, had two children, and his wife kept a rooming house on one of the thoroughfares of the city. This case became quite celebrated in a newspaper way. I was not in St. Louis at the time, but one of my colleagues upon examination of the man found him to be suffering with leprosy. The man's name was H. He was told of his condition, which, of course, was a frightful shock to him. Leprosy is a quarantinable disease in our State, therefore the board of health were immediately notified, and the patient was put under arrest. He was conveyed in an ambulance to a small house near the smallpox hospital on the outskirts of the city. The building was already occupied by a Chinese leper who had had the disease for a number of years and was horribly mutilated and hideous to behold. The poor Chinaman, however, warmly welcomed his companion in suffering, with the hideous leper smile, and held out his mutilated hands in token. A guard was placed at the entrance to the cottage, but as dusk approached H. escaped. He appeared at the residence of some relatives of his, who lived in a village across the river in Illinois, as he feared to visit his wife or children.

In the meantime the evening papers made flaring headlines of the case and the relatives, therefore, were informed of his pitiable condition and he was driven from their door and from the village. He ran like a maddened animal into the woods and was hounded from town to town. He finally took blind baggage and escaped into Mexico, where he remained for a few months. This man was an ex-soldier in the Philippines, where he, no doubt, had become infected with the disease. He had been honorably discharged and was at that time laboring in the support of his family. The newspapers gave a detailed account of his harrowing experience, and when he subsequently appeared in St. Louis I visited him in quarantine, when he also gave me the details of his life since he had been pronounced a leper. He has appeared in St. Louis several times, has escaped, and has been arrested in various cities in the Union. At present, I believe he is in Chicago. The harrowing and frightful experience of this man made a terrible impression upon my associates in the clinic and they declared that they would never again, until proper facilities were provided for the human care of these people, declare a man a leper. This case, from what we know of leprosy, is a menace in his peregrinations to many of those he may come in contact with. He had infectious lesions; the mucous membranes of his nose were full of lepra bacilli. Every time he sneezed

or coughed in a railroad train or in a café, he sprayed the surroundings with lepra bacilli. His hands, contaminated with these discharges, were no doubt infectious in hundreds of ways. He must deposit lepra bacilli in the railings and seats of street cars, upon those of railway trains, and has been a splendid disseminator of the disease. He would willingly, as he said to me, live in a habiltable and humane asylum. He did not go near his family, but he was nearly driven mad by his isolation and his lack of companionship and the accommodations afforded him; therefore he wandered desperately from place to place.

A few months after that, a man appeared at our clinic, an old leper. He had been in the Philippines as a brakeman some 14 years before, and he stated that his leprosy did not appear for 12 years after his visit to the Philippines. The case of H. appeared 10 years after his visit to the Philippines. This brakeman had gone through the same experience as the case just cited. He had visited many States in the Union, looking for a proper home. He was placed in the leper house near the quarantine in St. Louis, but in a short while escaped and is now probably wandering from place to place, as hundreds of lepers are likewise doing to-day. The mucous membranes of this man's nose also teemed with the lepra bacilli upon actual microscopic examination. He was just as infectious to the public as H. Upon cutting out a piece of the skin in both these cases lepra bacilli were found by the thousands.

These cases are only two of at least 10 of this character that have come under my personal observation. St. Louis is no different from any other large city, and men in the same professional position as myself in other cities can give you exactly similar experiences. Both of these lepers cited were intelligent men, Americans, deserving a better fate. They had served their country. Lepers do not change their ideas of humanity, they suffer, they need care; but no matter how much humanity may exist in the hearts of their physicians, they are powerless to help them under the hysterical dread with which leprosy is held by the community and under the lack of national laws and national preparation made for these people.

We have had several Chinese lepers in St. Louis. We have had lepers among men of the better walks of life, rich men, men who could afford every luxury. These I have advised to immediately go to various leper asylums in Europe, where they could receive proper treatment.

The thing that impresses me in connection with these cases and the dire need of national regulation and a national home for lepers is, in the first place, that we know from the history of the disease that leprosy is a communicable disease. We do not, unfortunately, know the means or the manner or the method by which it is communicated from individual to individual. In all probability, it seems that this must take place through some bloodsucking insect, probably the bedbug or the body louse. The insect bites a leper, the blood or the skin of the leper is usually teeming with these organisms; the insect is thus infected and when it comes in contact in its hunger with a leper-free individual the bite may thus act as an inoculation. Several physicians of the Department of Public Health in their studies upon leprosy in the Philippines and the

Sandwich Islands have demonstrated lepra bacilli in the intestinal canal of the bedbug when allowed to feed upon leprous individuals. Again, it may be communicated through accidental inoculation, through the inhalation into the mucous membrane of leprous infected dust.

We know from history that segregation is the proper way to handle the disease, as after segregation has existed for some years in infected countries the disease has gradually disappeared. We know this from the earliest authentic history. Leprosy is said to have been introduced into Europe from Egpyt, where the disease had existed for two or three thousand years before Christ, Egypt having been inoculated by the negroes farther in the interior. The soldiers of Rome are said to have carried it from Egypt and disseminated it over Europe. The disease slowly but surely increased, until the populace finally were forced to protect themselves against its propagation by the establishment of leper houses. Isolation houses are mentioned in France as far back as 560 A. D. The disease increased so rapidly that during the thirteenth century in France alone there were about 2,000 leper asylums and over 200 in Great Britain. The study of history shows that isolation is the one great preventive in the spread of this disease. This has been many times demonstrated and is an undeniable fact.

It is a law that a race virgin to a given infection is very vulnerable to that infection. Herein lies one of the great dangers of leprosy to the American people. That is, leprosy has not seemingly existed in a great degree up to now in this country, but just for that reason, that fact, our ignorance of it, the ignorance of our physicians in the recognition of it, the carelessness with which lepers are allowed to go in interstate traffic and thus mix with the populace, gives more chance for the spread of the disease than in a country where it had existed and the government, therefore, were more familiar with the methods for the protection of the people.

The period of incubation of leprosy makes it an extremely dangerous disease in a nation. The incubation period is the period between the time the individual is exposed to the disease and the appearance of diagnostic symptoms. The period of incubation in leprosy in all of the cases I have seen, where the patient probably picked it up in the Philippines, in Hawaii, or in some of our island possessions, has been at least 10 years; one of them 12 years. Others report the period of incubation from 6 months to 25 years. You can readily see how insidious, how confusing, how dangerous this disease is in this way. One may have leprosy, therefore, for years and not know it. The mucous membranes of the nose, where the disease usually first appears, may teem for years with lepra bacilli and yet the individual be ignorant of his condition. Sometimes during this period there are chills and fever and a feeling of illness, without any other diagnostic symptoms, the diagnosis usually being malaria, until years roll by, when at a certain time the symptoms culminate in an outburst of skin eruption, which, by one familiar with the disease, is readily diagnosed. But during this period of ill feeling, of chills or fever, the disease could be recognized by the microscopic examination of secretions from the nose. In 70 per cent of cases of leprosy the bacilli are readily demonstrable in microscopic smears

made from the nose. Thus, as I have mentioned before, there is a source of great danger in sneezing, as by such means the lepra bacilli are sprayed into the air.

Leprosy was probably introduced into this country through the importation of slaves, probably first in Peru and later throughout the States. Statistics made in this country do not give any idea of the extent of the disease. In an attempt to compile statistics, the United States Public Health Service found that seventy-odd per cent of the cases recorded were in individuals at large. Therefore the large majority of lepers in this country are at large, only a comparatively few under segregation. Any disease known to be communicable under these conditions must increase. I have known of one instance where the disease was conveyed from son to mother and sister, the son having been a soldier in the Philippines; another one, where a father conveyed the disease to his wife and daughter, the source of the father's infection never being unraveled. He killed himself, his daughter died, and his wife has lately died in one of the three State leprosaria in this country. In both these instances, the people were of high social standing, cultured, educated people. Therefore, one can see just from these two instances that the disease is communicated and has been communicated from one individual to another in our climate. Therefore it will naturally, in the course of the natural laws governing infection, spread.

Senator WEEKS. What are the sources?

Dr. ENGMAN. The sources at present are our own foci in this country, our island possessions through commerce, and any other foci in the world where American citizens may come in contact with it. Now, that the different countries of the world are so closely connected by luxurious and rapid ships and our citizens, through mercantile and military connections, are therefore constantly exposed to virile foci of this infection, the individual may come unconsciously in contact with the disease or be bitten by an insect which has previously fed upon a leper, be thus inoculated, come home, and may thus unconsciously disseminate the disease among his relatives and friends. This has occurred among soldiers, workingmen, Government, attachés, etc.

Senator WEEKS. Are not those men examined when they come into this country?

Dr. ENGMAN. I suppose they are given the usual examination. As I have said before, one thus inoculated would probably show no signs of leprosy when he came into the country and unless he had symptoms upon his skin it is doubtful with our present methods if the disease could be recognized. To otherwise control it, the secretions from the nose of every individual would have to be examined for lepra bacilli, unless there were sufficient diagnostic evidence on the skin. Therefore, it is not likely that everyone returning from the Philippines or from leprous foci could be thus microscopically examined. Even then it might escape attention, as the period for the accumulation of the virus in the body may not have culminated. As I said, it may take years before the organism can be detected in the blood or the secretions, or before any symptoms appear whatsoever. We have no serum test for leprosy like we have for syphilis.

Senator WORKS. No blood test or serum test, you say?

Dr. ENGMAN. No; there is no well-proven test except through the presence of the bacilli.

Senator WORKS. Do you not find the bacilli in the blood?

Dr. ENGMAN. It is found in the blood, yes; but it is very difficult to demonstrate, and it is easy to demonstrate in the nasal secretions.

The CHAIRMAN. Is there a very critical examination made of our people returning from the Philippines—our soldiers, for instance?

Dr. ENGMAN. No, sir; not from the standpoint of leprosy.

The CHAIRMAN. I should not think so.

Dr. ENGMAN. The only examination that can be made of soldiers returning from the Philippines would be a very careful examination, microscopically, of nasal secretions. Whether that is feasible or not, as I have said before, I can not say.

Senator WORKS. You would not expect anybody to be sent to this sanatorium until it was demonstrated that he was afflicted with the disease, would you?

Dr. ENGMAN. By no means; no.

Senator WORKS. You would not send anybody to the sanatorium where there was any doubt about it, would you?

Dr. ENGMAN. No.

The CHAIRMAN. If there was an asylum of that kind established, would your clinic hesitate to make known the existence of cases? You spoke of the great horror of these cases you described.

Dr. ENGMAN. I am sure that none of us would hesitate to make a diagnosis of leprosy, if leprosy existed, if there was a proper place for the humane care and medical treatment of these cases. My colleagues were so shocked by the horrors of the cases I have described that they did not wish to place another individual in a similar situation. In our own State, Missouri, leprosy is a quarantinable disease, and the patient is at once arrested and isolated. If there were a national leprosarium, of course, every case of that kind would be reported. I am sure that a great number of lepers in this country are not reported from a pure humanity standpoint, and are concealed by friends or the family.

The CHAIRMAN. There would, then, be a great many more cases reported than anybody knows about now, would there not?

Dr. ENGMAN. Evidently. Now, as I said, they are concealed, there is no place for them to go, they are isolated, placed alone here and there at the edge of cities or in huts in the woods, food is brought to them by those afraid of the disease or it is thrown to them; they are hounded from village to village. I have known of them to be stoned. Only three States in the Union offer them a home. Loneliness and lack of human sympathy, alone with the horror of themselves, the terror of the disease, a life unthinkable is the lot of a leper in this country.

Senator BECKHAM. How many cases have you observed in your experience?

Dr. ENGMAN. Of that kind?

Senator BECKHAM. Of leprosy, yes.

Dr. ENGMAN. Oh, I have seen, I suppose, several hundred cases during my professional career.

The CHAIRMAN. How does the medical profession feel toward some measure of this kind?

Dr. ENGMAN. The medical profession for many, many years, as medical literature shows, has earnestly desired an institution like the

one for which this bill provides. In 1913, after the dramatic incidents connected with the cases of leprosy I spoke of occurred, I made a special visit to Washington and inquired into the possibility of the Government providing a national home for these cases, but found that it had proven a very hopeless task to induce the Government to take up the matter. At a meeting of the American Medical Association I introduced in the section upon dermatology, on Wednesday, June 24, 1914, the following resolutions on leprosy, a motion to make this a special order of business being unanimously adopted (reading):

To the honorable house of delegates of the American Medical Association:

The section on dermatology of the American Medical Association respectfully submit the following resolutions, which have been unanimously adopted by the section on June 24, 1914:

Whereas leprosy exists in many foci in this country, and has been statistically shown to be on the increase; and

Whereas those affected with leprosy are being subjected to most inhuman treatment; and

Whereas many lepers are traveling in interstate traffic because of the inhuman treatment to which they are subjected, thereby constantly exposing the general public to the contagion; and

Whereas it is the duty of the Federal Government to control traffic between the States; and

Whereas at the present time the care of the lepers in the United States is a great economic burden upon the individual States and is, moreover, of necessity inadequate from a medical and sanitary standpoint: Therefore be it

Resolved, That the association recommends the passage by Congress of a law for the comprehensive care and control of leprosy by the Federal Government.

Dr. ENGMAN. This passed the house of delegates of the American Medical Association on June 26, 1914. I also placed a similar resolution before the American Dermatological Association, a body which represents the leper experts of this country, or, rather those men who have devoted their lives to the study of skin diseases, of which leprosy is a branch. This association also unanimously adopted these resolutions and recommended that Congress be requested to pass a law for the comprehensive care and control of lepers by the Federal Government. A joint committee was appointed by both associations—that is, the American Medical Association and the American Dermatological Association—consisting of Dr. Politzer, of New York; Dr. Winfield, of Brooklyn; and myself, as chairman. I see by the medical journals that medical societies over all sections of the United States have passed similar resolutions to those above cited.

The CHAIRMAN. Were those resolutions passed?

Dr. ENGMAN. Yes, sir; they were unanimously passed by both associations referred to. From conversation with prominent medical men all over the country I am convinced if there is not some method adopted very soon for the control and segregation of lepers in the not very distant future we may be compelled to do it on account of the then obvious and startling increase of the disease.

The CHAIRMAN. Why do you think there may be a startling increase in the disease? What is your reason for thinking that?

Dr. ENGMAN. Having a knowledge of the history of leprosy in the various countries of the world, having a knowledge of the nature of the disease, having a knowledge of the medical investigations that have been made into the disease, judging from my own personal experience and reasoning from analogy and a knowledge of other infectious diseases and their method of propagation, and from earnest

scientific consultation with other medical men who have thought deeply about this disease, I have come to that conclusion. Those are my reasons.

Senator WORKS. It is estimated that there are about 800 leprosy patients in this country. Do you think that is a fair estimate?

Dr. ENGMAN. No, sir.

Senator WORKS. What would be your estimate?

Dr. ENGMAN. It would be absolutely impossible to make an accurate estimate, but I am positive that the above number of cases is far too small.

The CHAIRMAN. You think there are a great many more?

Dr. ENGMAN. Oh, yes; there must be at least three times that many. For instance, in the statistics of the Marine Hospital before referred to, made, I believe, in 1911, Missouri is accredited with one case, when I positively know there were at that time in the city of St. Louis alone three cases, whereas I am sure that other medical men in the city must have had a knowledge of other cases.

Senator WORKS. Are there any statistics showing what has been the yearly increase in this disease?

Dr. ENGMAN. In this country?

Senator WORKS. Yes.

Dr. ENGMAN. No, sir; the statistics on leprosy are absolutely unreliable in this country and in other countries on account of the nature of the disease. Many cases have remained undiagnosed sometimes for years in communities, due to the local medical men not being experienced in the symptoms of the disease. Physicians in ordinary practice have never seen the disease and therefore probably would not think of it in making a diagnosis. I have seen this happen many times, even though the disease be far advanced, because it is the last disease the average practitioner would think of.

Senator WORKS. How many years has it existed in this country?

Dr. ENGMAN. I do not know. It certainly did not exist in this country before the Spanish conquest of Mexico by Cortez. There are no evidences of it among Indian relics or among the pre-Colombian Indians. It was probably introduced at a very early time into South America, Colombia, Canada, and in this country through the pioneers or through slavery.

Senator WORKS. Up to the present time the increase has not been very rapid, has it?

Dr. ENGMAN. I do not see that we can estimate the number of cases in this country with any accuracy at all. Up to the time of the Spanish-American War we did not seem to have very virile foci of the disease, but since that time I, for one, have been seeing more leprosy; and, as I have said before, the great commercial necessity for travel and, therefore, exposure to leprous foci must naturally expose citizens of this country to the disease. For instance, I know of a very striking case of a young lady who some time ago visited the Sandwich Islands. Within a year after returning she developed a red spot on the arm, where she distinctly remembered she had been bitten by some insect while in the Sandwich Islands. The case proved to be leprosy, and had an exceedingly rapid course. The lady did not remember of having seen a leper while there, but this incident, although a single one, and I think I have cited others here—

and any medical man with an experience with this disease can also cite similar instances—should demonstrate the fact that leprosy is certainly on the increase in this country. I am sure that if statistics could be accurately compiled they would demonstrate a startling increase of leprosy in the last 10 years.

Senator WORKS. I was only trying to arrive at the probable increase, which you suggested as startling.

Dr. ENGMAN. There is not an apparently startling or dramatic increase as yet.

The CHAIRMAN. It has not startlingly spread yet, but may do so in the future?

Dr. ENGMAN. That is right, sir.

The CHAIRMAN. When it started in the Hawaiian Islands, in 1831, I believe, it spread very rapidly there, did it not?

Dr. ENGMAN. Yes, sir; it decimated the population in a comparatively few years.

The CHAIRMAN. It might do the same thing here if it got started, might it not?

Dr. ENGMAN. That has been the history in most of the countries of the world where it has existed and insidiously spread, not only in the Sandwich Islands alone but in every other country, until segregation stopped it. It has been the history of the disease in every country that it would insidiously exist and increase in a secret way for a long while, when people would awaken to the necessity of adopting some measures to prevent its increase. The reason, in these instances, of this apparent sudden increase may have been changed climatic conditions or hygienic, dietetic, or economic conditions. Apparently there are a few sporadic cases at first and then, in the course of a few decades, an apparent but absolute large increase in actual numbers.

Senator WORKS. The increase in the lepers in this country has not kept pace with the increase in population, has it?

Dr. ENGMAN. That I can not say, because I have no way of computing accurate statistics. I do not believe that such a compilation could be attempted without comprehensive laws to compel physicians to report every suspected case and force every leper to come into the light. I have for years, ever since the Spanish-American War, repeatedly called attention in medical literature to the absolute necessity for a leper home and passage of laws regulating the migration of lepers and the control of lepers. The medical literature of this country teems with articles by thinking medical men upon this necessity.

The CHAIRMAN. Is there any positive means for determining the disease?

Dr. ENGMAN. From the individual?

The CHAIRMAN. Yes.

Dr. ENGMAN. By the presence of the bacillus of Hansen, the lepra bacillus, in the nasal secretions. These bacilli may be also cultivated and microscopically demonstrated from the skin lesions of lepers. Those are the most common methods.

The CHAIRMAN. How about the blood when any one of these symptoms you described appears? Can you tell from an examination of the blood whether leprosy exists or not?

Dr. ENGMAN. That can be done by cultural methods, by cultivating the bacilli from the blood, which is a very troublesome, intricate, and expensive one.

The CHAIRMAN. What have you to say with regard to the cure of leprosy?

Dr. ENGMAN. I have seen cases that were symptomatically cured; that is, for years they have remained without symptoms of the disease, but whether they would develop symptoms some time in the future I could not say. Certainly, they were symptomatically cured. We call it "cured," because there is at that time no evidence of the disease apparently remaining. But such cures can only be accomplished by long treatment.

Senator WEEKS. Have there been cases of recurrence of the disease?

Dr. ENGMAN. Yes; I know of three cases which occurred in private practice, but not in public practice, which were apparently cured. One was a school-teacher in a large city of Alabama. She taught school for many years with hundreds of the lesions of leprosy scattered over her body. Her nasal secretions teemed with the bacilli. She was brought to St. Louis for a diagnosis of her peculiar skin disease and several physicians saw her. From a lesion of the skin and from the secretion of the nose the bacilli of leprosy were demonstrated. She was the principal of a public school in this Alabama city, and had held this position for many years. She was a bright, intelligent, splendid woman. Just think of what danger she was to the scholars under her care. They were constantly exposed to the exhalations from her nose and the bacilli from her skin day in and day out. This poor woman was horrified over her condition and over the exposure that the children had sustained during her long term of office. She was sent to Europe and returned symptomatically cured and remained so when I last heard of her.

Senator WEEKS. During this time had she communicated the disease to any one?

Dr. ENGMAN. No one can tell. Whether there has been a marked increase of leprosy in this section of Alabama where this one woman came from, I do not know. Being a principal of a school and coming in contact with these children from day to day and from year to year, it is possible and highly probable that she did communicate it to others. We can not tell. Leprosy is not a thing to be swept into a corner and screened off. We have not been awakened to this problem properly. After this idea has been faced for 20 years and careful statistics taken we can then estimate in a more accurate way the source of infection in certain communities and the rate of increase of the disease. Now, for instance, in the case of this school-teacher, those children should be watched for years and followed up when they move to other communities, as they may be possible foci of infection if they had contracted the disease.

The CHAIRMAN. You say that symptoms of the disease do not break out for 5, 10, 15, or 20 years. How long is it supposed that, normally, the disease will develop after a person is exposed?

Dr. ENGMAN. There is no positive time. Probably six months to two years would be the shortest periods of incubation; but I believe in this climate, as I have said before, the period of incubation is frequently ten years or longer.

The CHAIRMAN. You say six months to two years?

Dr. ENGMAN. I should think that would be the shortest period of incubation.

(Whereupon, at 12.10 o'clock p. m., the committee took a recess until 2.30 o'clock p. m.)

AFTER RECESS.

The committee reassembled at 2.30 o'clock p. m., pursuant to the taking of recess.

Senator WORKS. There is no one here representing the State of California at this hearing, and I have been asked to state the fact that the State Board of Health of California is favorable to this measure, which I do very gladly, and I have received resolutions from boards of supervisors in our State and others favoring this legislation.

The CHAIRMAN. Dr. McKean, you may proceed.

STATEMENT OF DR. J. W. McKEAN, CHIENGMAI, SIAM.

The CHAIRMAN. Dr. McKean, you have given your full name and your residence to the stenographer?

Dr. McKEAN. Yes; my residence is in Siam, but I am an American citizen, resident abroad.

The CHAIRMAN. Without asking you any questions, as you have to catch an early train, I will ask you to make a statement in regard to this bill in your own way and let us have the benefit of your experience with regard to leprosy.

Dr. McKEAN. It would seem from the testimony that has been brought out this morning, as well as from my own observation, that this bill is really a very desirable thing. Of course I am not familiar with all the details of legislation in America; but, at any rate, we know that leprosy is a contagious disease, and practically an incurable disease; at least, so near incurable that every person who has it should consider himself doomed.

The CHAIRMAN. Tell us how much experience you have had with it.

Dr. McKEAN. My experience has been for 26 years in this oriental country, and 20 of those years, or more, I have been handling lepers and treating them.

The CHAIRMAN. Where?

Dr. McKEAN. In north Siam, and I now have the pleasure of being superintendent of a leper asylum where we have 180 lepers at the present time.

Of course, they come and go; sometimes they leave, and sometimes they die there. We have had in the past seven years about 300 lepers in our asylum, and I have treated many others as they come to us along the highway, because in Siam there is no attempt to segregate them; the leper wanders about from place to place. We certainly know it is a contagious disease in that country. We had one family in our asylum—four persons of that family were lepers, and four other persons of the same family died of leprosy before these others came into the asylum; eight persons—a father, mother, and six children, all lepers. The contagiousness of the disease, of course, is acknowledged by all medical men the world over. As to how the contagion is carried, we do not know, but my observa-

KWANGJU LEPER ASYLUM, KWANGJU, KOREA.

CHIENGMAI, SIAM, LEPER ASYLUM.

tion would lead me to believe that in the East, at least in the Tropics, it is probably carried by blood-sucking creatures, such as the bedbug, and probably the itch parasite; that it is probably communicated also by the fact that the leper member of the family sits with the other members of the family at a small table about 18 inches in diameter. They sit closely around this table, and if the leper member of the family sneezes or coughs over this table, the food on the table is likely to be contaminated by discharges from his nasal mucus. The bacilli of leprosy appear in the nasal mucus early in the disease, and that that is possibly one of the ways in which the disease is conveyed to others. These things are problematical and merely surmise, but they seem to be plausible.

We have two remarkable instances in history of the rapid spread of leprosy. One was in Europe during the Middle Ages, when leprosy came from the Orient and spread all over Europe in such a rapid manner that all the Governments of Europe and all the clergy were very much alarmed at the frightful spread of the disease, and very stringent measures were adopted and very stringent laws enacted. The lepers were forced into leper asylums, and during the four centuries from 1094 to 1472, there were no less than 21,000 leper asylums, large and small, built in Europe. In Great Britain alone there were 112, and in France there were 2,000, and the result of this stringent legislation was that leprosy practically disappeared from Europe, and instead of there being thousands and thousands of cases, there were very few of them left. The last British leper died more than a century ago.

Senator Works. Just what was the restriction in their legislation that brought about that result?

Dr. McKean. It was forcing them into these leprosariums or leper refuges, by law; they were supposed to be dead to the world; funeral services were read over them, and they never appeared again outside.

While it was very stringent and very trying to those who were treated, still it was for the public good, evidently.

Then we have in the history of Hawaii a remarkable spread of the disease. About 1835, I believe, the first leper came to the Hawaiian Islands, and within a period of 50 years it spread over the islands until there were many thousands of them.

When our Government took over those islands they found a fearful condition there. I think a still more remarkable instance of what can be done by segregation is furnished by the Philippines. When the United States took over the Philippines they found lepers everywhere, and it was estimated there were at least 1,200 new cases every year. Dr. Victor G. Heiser, who was made director of public health, and held that position for 12 years, personally superintended the segregation of nearly 9,000 lepers in the Philippines. They were segregated on the Island of Culion, where they were given every possible comfort.

Here they have their own form of government, their own police court, and special coinage for their individual use, and they live in comfort. At the present time we have on that island only 3,500 lepers, showing that of these nearly 9,000 lepers the rest have passed away according to the natural order of the disease, and the spread of the disease is practically inhibited in the Philippines, and it is probable that these other 3,500 lepers will soon pass away in the

same way, under a condition of comfort and without menacing other people.

The American Government in the Philippines enjoys the distinction of being the only Oriental country in the world that has segregated the leper, and where the disease is not permitted to spread.

The CHAIRMAN. That is done under our management in the Philippines?

Dr. McKEAN. Yes, sir.

The CHAIRMAN. Is that the result of a statute enacted by Congress, or just the way they handle it there?

Dr. McKEAN. I can not tell you that. It is some Philippine law. Whether the Congress of the United States did it or not I can not say.

We have those two remarkable instances of the spread of leprosy, a d then we have also those two remarkable instances of the control of the disease by segregation.

We should be impressed with the fact that not only is this proposed leprosarium for the care of the lepers, who are now hounded about worse than a dog about the streets, but it would also relieve the public from the danger of contagion and rid our United States from the curse of leprosy.

Senator WORKS. Do you know how many new cases they are segregating in the Hawaiian Islands now?

Dr. McKEAN. I am not familiar with the conditions there.

Senator WORKS. Or how it is in the Philippines?

Dr. McKEAN. It is supposed that every leper in the Philippines has been segregated. There are possibly some in the distant villages.

Senator WORKS. That is what I wanted to ascertain—whether any new cases are being discovered and segregated?

Dr. McKEAN. No; there are no new cases being discovered now; there has been a very diligent search throughout the whole of the Philippines, conducted in a very humane and kindly way, but a very, very thorough search. however, even into the distant mountain districts; apprehending and bringing to Culion every leper; so now there are no cases of leprosy in the Philippines, so far as is known, outside of those isolated at Culion.

The CHAIRMAN. What do you think as to the advisability of such legislation as this bill contemplates?

Dr. McKEAN. It seems to me eminently desirable and proper, for the good of the country and for doing away with this fearful disease; for we do not know, as Dr. Fox indicated this morning and as others have also indicated, what day it will begin to spread rapidly and prove a tremendous curse, too difficult to handle, while at the present time it is comparatively easy to handle.

The CHAIRMAN. Do you think it reasonable to suppose, judging from the past history of the disease the world over, that it is liable to spread if we do not take some measure to segregate it or prevent its spread?

Dr. McKEAN. These two ancient examples. one from the eleventh to the fifteenth century in Europe and one here recently in Hawaii, would seem to indicate that. At times it shows a wonderful recrudescence. For instance, many of my patients seem to be cured; they sleep and eat well and seem to be thoroughly comfortable. and then,

CULION LEPER COLONY, PHILIPPINE ISLANDS, AT CLOSE RANGE.

TUNGKUN, CHINA, LEPER ASYLUM.

A SECTION OF AN INDIAN LEPER ASYLUM, PURULIA.

after you think they are cured, the disease breaks out in all its original vigor, and the patient goes from bad to worse.

The CHAIRMAN. Have you known of cases where they were actually cured and where the disease never broke out again?

Dr. MCKEAN. I have not known of any such case. We have been using the Chaulmoogra oil, but I do not know of any complete cure. Many of them are apparently cured, and most of them improve very much with its use.

The CHAIRMAN. You mentioned a Dr. Heiser, who is in charge of the work in the Philippines. Who is this Dr. Heiser—is he a citizen of the United States?

Dr. MCKEAN. Yes; he is a citizen of the United States and a surgeon in the United States Public Health Service.

The CHAIRMAN. He is one of the doctors in the Public Health Service?

Dr. MCKEAN. Yes; he was at that time, and he is still.

The CHAIRMAN. Doctor, we are very much obliged to you, sir, and we are sorry that you have to rush away. We thank you very much for coming here.

Dr. MCKEAN. Not at all, gentlemen; I thank you.

The CHAIRMAN. We will now ask Mr. Danner to take the witness chair.

STATEMENT OF W. M. DANNER, AMERICAN SECRETARY OF THE MISSION TO LEPERS.

The CHAIRMAN. Are you a physician, Mr. Danner?

Mr. DANNER. No, Senator Ransdell; I am only a layman, in charge of the secretary's office for the American Council of the Mission to Lepers, an organization interested in world-wide work for lepers.

The CHAIRMAN. How long have you been studying leprosy in connection with your official duties?

Mr. DANNER. Five years. May I stand up, as I would like to show a map and some photographs that will make my presentation very brief and easily understood? The large map I hold in my hand readily calls attention to the care of lepers as a world problem. The Mission to Lepers is interested from the standpoint of helping where ever lepers live. This map has been shaded heavily to indicate the countries where the most lepers are found, and by light shading to indicate in some other countries where only a few are found. Many people are surprised to find that there are lepers in Iceland even. Mrs. Wilbur F. Crafts is here to-day. She has visited the Iceland colony of lepers. I hope she may tell of that colony.

The CHAIRMAN. What does the red on your map indicate?

Mr. DANNER. The dark red indicates countries where the greatest number of lepers are living, and the light shading indicates countries where there are some lepers, but not a great many, in some countries only a few cases. You will notice the light shading across the part representing North America. While these lepers constitute a menace to the community, even though they are lepers they are still human beings. Is there any question whether the Nation is called upon, for the sake of humanity, to protect other members of society, to take such measures as will at once operate to better the condition of the leper, and throw out proper safeguards against the spread of

the disease? Newspaper reports tell how a business man at Bay City, Mich., on a trip to Iowa, was suddenly taken sick, went to see a doctor, and the doctor diagnosed his trouble as leprosy. Then he was sent off to live in a smallpox hospital at Centerville. He said "I do not want to live here; I want to pay my way back home." They said, "No; you can not leave here. You must go to the detention hospital." He said, "No; I want to go home; I can pay my way." He was told, so the newspapers said, "If you can get permission from the State boards of health of Iowa and other States through which you will have to pass, and can hire a freight car, and will agree to burn it up when you get to your destination, we will let you go back." I have been told by a friend that he did not go away in a freight car, but it was a very unfortunate and expensive way for a sick man to have to get back home.

The CHAIRMAN. Is there any reason why you should not tell us how he got back?

Mr. DANNER. My friend there said he hired an automobile to take him back home.

The CHAIRMAN. And went all the way from Iowa to Bay City, Mich., in an automobile?

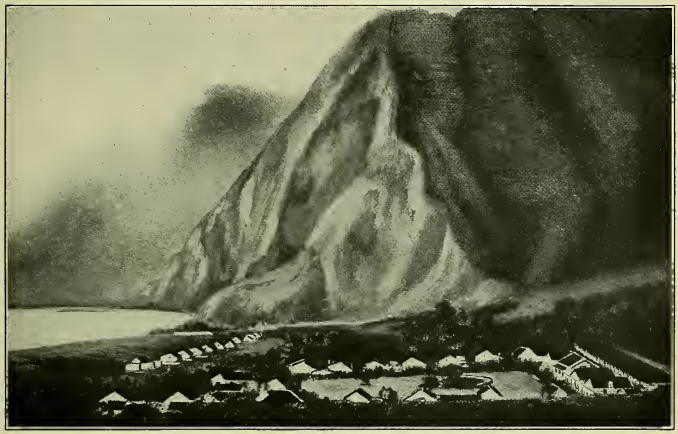
Mr. DANNER. Yes; that is the story as told to me. This method provided the only way that he could travel without being interfered with on his way.

The CHAIRMAN. In connection with your map, would you mind stating how many lepers there are estimated to be in the world?

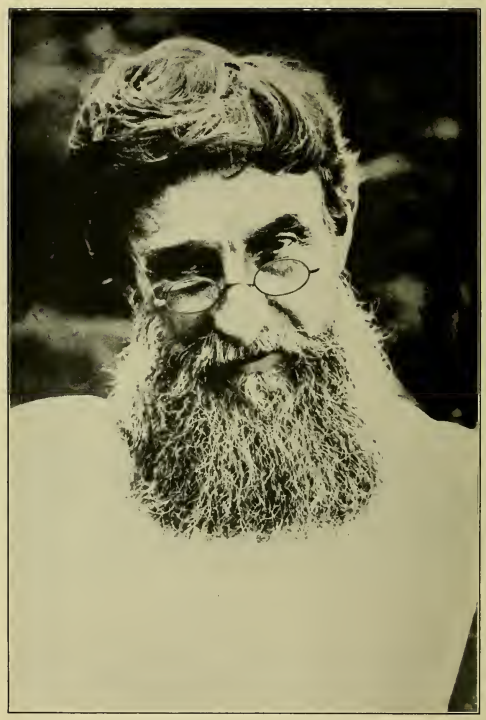
Mr. DANNER. Yes, sir; there are three estimates. Our mission officers estimate the number as at least 1,000,000. Dr. Victor G. Heiser, in January World's Work, estimates that there are 2,000,000, and the Medical Review of Reviews, a medical journal, in a recent issue, estimates the number at 3,000,000. Even if there are only 1,000,000 lepers in the whole world, the number is large enough to be a world menace. I would like to emphasize the importance of this question, even to the States in which there are no known lepers living at this time.

There was a schoolboy in Upton, Mass.—not a native of Massachusetts—mingling with the boys and girls in his class and sitting at the same desks with them. For at least two years he was being treated by a doctor in Upton for some skin trouble which the Upton doctor did not seem to understand. Finally this doctor gave the case up and referred the boy to the Massachusetts General Hospital to see if he could there find out what was the matter. The experienced doctors at this hospital examined him and diagnosed his trouble as leprosy. Then by the law of Massachusetts he had to go and live in the leper colony. No further case of leprosy at Upton has resulted so far from this case, though he had mingled freely with the other children in the school and around the village. We now know that the leper germ is very slow to make its manifestations, and notwithstanding that there has been no new case reported in five or six years there still might be some cases develop in the future. The school building was thoroughly fumigated. The boy's books and his desk were burned.

The CHAIRMAN. But cases of the disease may still develop from that later?



BALDWIN HOME, KALAWAO, MOLOKAI.



BROTHER JOSEPH DUTTON, WHO SUCCEEDED FATHER DAMIEN WHEN HE CONTRACTED LEPROSY IN CARING FOR LEPERS AT MOLOKAI, H. I.

Mr. DANNER. Yes. It is entirely possible that it may develop many years later. In fact, the gentleman on this committee who this morning spoke of his experience among the lepers 30 years ago may develop a case even yet. It is possible that I may have it some day. I do not think I will. I hope not. We think leprosy contagious by prolonged contact. The Mission to Lepers is interested in 90 asylums throughout the world. The only missionary connected with these asylums who has leprosy is a woman who contracted the disease before she went to work for the lepers, and she does not know how she contracted it.

The CHAIRMAN. Have you any idea how many lepers there are in the United States?

Mr. DANNER. My estimate, Senator, is based altogether on personal observation of unreported cases and the estimates I have heard made by physicians who have been caring for lepers in the United States. I have referred to the number as approximately 500. This would be my own personal estimate. Perhaps I am more conservative than some others, but there is no way of proving that there are not 3,000 at the present time, as estimated this morning by Dr. Engman, of St. Louis.

Mention was made this morning of the Hawaiian leper colony. I have here just a small photograph of the station in Molokai, where Father Damien spent 17 years of his life. Many people have gotten the wrong impression from the stories circulated about Father Damien, indicating that one working among lepers will always contract leprosy. His successor has spent 30 years there and has never had a sign of it. Here is his photograph.

The CHAIRMAN. Who was his successor?

Mr. DANNER. Brother Joseph Dutton, who by living a clean, careful life seems quite immune from the disease. I would plead for a national leprosarium because the lepers are human beings and deserve proper humane treatment and because this care, when given in the right way, is appreciated, and best of all, because, through a proper segregation of lepers, the number of cases of the disease may be quickly reduced and in a reasonable time the terrible malady eradicated from a given territory. Dr. Victor G. Heiser, in "Fighting Leprosy in the Philippines," appearing on page 310 of the January World's Work, tells how some lepers in the Philippine colony have been discharged as cured and how the total number of known lepers has been reduced from over 8,000 to 3,600 within a period of less than 10 years, all by segregation and care for the Philippine lepers.

The CHAIRMAN. You may insert the whole article in the record.

Mr. DANNER. Very well, sir. Thank you.

(The article referred to was subsequently submitted, and is here printed in full, as follows:)

FIGHTING LEPROSY IN THE PHILIPPINES—WHAT HAS BEEN DONE IN ONE OF THE POSSESSIONS OF THE UNITED STATES TO COMBAT THIS MOST DREADED OF ALL DISEASES—HOPEFUL RESULTS FROM THE USE OF CHAULMOOGRA OIL.[1]

[By Victor G. Heiser, M. D.]

Dr. Victor G. Heiser, who writes the following account of his experiments on lepers in the Philippine Islands—experiments that promise to result in a permanent cure of one of the most dreadful and famous diseases in history—was for

[1] World's Work, January, 1916.

more than 10 years in charge of the sanitation of the Philippines. When he went there experienced Europeans ridiculed his proposals to make orientals pay any attention to sanitation. As a result of the work of Dr. Heiser and his associates, however, the Philippine Islands to-day are more sanitary than the United States. The influence of his work has so spread throughout the East that so formidable a task as cleaning up China is now being undertaken. Dr. Heiser's encouraging report on the new leprosy treatment, as well as his sympathetic picture of those pitiable people who, in a peculiar sense, are wards of the Nation—the lepers of Culion—is one of the most creditable chapters in recent American history.—The Editors.

In the last few months 23 lepers have been discharged as cured from the hospitals of the Philippines. In the United States Health Reports the writer announced the "apparent cure" of 6 individuals who for several years had suffered from this disease. In these latter cases the official publication had been withheld for two years, for the reason that in many previous experimentations with leprosy patients apparently restored to complete health had subsequently relapsed. In these cases there had been no permanent cure—the infection, one of the most insidious known, had simply existed quiescent, unperceived, only to break out again under provoking circumstances. It was safely assumed, however, that anyone "cured" of leprosy who remained cured for two years could be regarded as permanently free from the disease. Since describing these six cases another year has elapsed and all six are still, to outward appearances, in excellent health. The recent news from Manila, recording the cure of 23 more lepers, is naturally very encouraging. Reports from Hawaii, the Straits Settlements, the Malay States, India, and certain parts of the United States—leprosy, brought in by immigrants, prevails here to a greater extent than most Americans understand—also record satisfactory progress.

The outlook for a permanent cure is therefore very hopeful. It will take many years and exhaustive experimentation in all parts of the world to establish this fact definitely; but we have already obtained results that justify the widespread use of the treatment.

It sometimes seems as though the mere intuition of the less progressive peoples grasped more than the scientific wisdom of the Western World. The common people of the East can often merely by a glance detect a leper when the American or European physician, after a clinical examination, fails to find the disease. In such cases bacteriological examination will show, nine times out of ten, that the ignorant native is right and the western physician wrong. Similarly those leper-ridden lands have had for centuries their "cure" for leprosy. This is the chaulmoogra oil—an oil obtained from a tree which is indigenous to India. The people of India and other eastern countries have often asserted that this oil, if taken persistently enough, would destroy this disease. They have abundant stories of cures obtained in this way. Some years ago medical men in this country, especially Prof. Dyer, of New Orleans, attempted to test these claims. Prof. Dyer reported the successful use of chaulmoogra oil in the treatment of several lepers in the Iberville Parish leper colony, Louisiana. Later this treatment was used with some success in the Philippines. But the trouble was that very few people could take the medicine. They became so nauseated from its use that they could stand it only a few months at one time. Several years of continuous treatment was believed to be necessary to produce a cure.

Evidently the East Indians were right. The western experimenters saw indications enough that chaulmoogra oil exercised a decidedly antagonistic influence upon leprosy. Perhaps the scattered cures reported represented the patients who had had sufficient moral courage to keep up the treatment for years, or whose physical tenements were so constituted that nausea had not resulted. What western science has accomplished is the discovery of a method of administering this chaulmoogra oil that does not produce nausea. Chaulmoogra oil is mixed with camphorated oil and resorcin and given hypodermically. All the progress made in the treatment of leprosy is due to this simple procedure.

There are perhaps 2,000,000 lepers in the world at the present moment. From earliest times this disease has aroused intense interest. The fact that leprosy is one of the few diseases described in the Bible probably explains this. It will, therefore, interest the people of the United to learn that their Government has been one of the first to deal with the problem of its treatment and eradication on a large scale, and that these efforts have been more successful than any which have heretofore been made. If our annexation of the Philippines leads to the cure of leprosy, certainly that itself will justify us.

When Uncle Sam undertook the solution of the leprosy problem in the Philippine Islands, the number of lepers there was estimated from six to thirty thousand. A census disclosed that the number did not exceed 6,000. Obviously the desirable thing was to cure the victims and to prevent the spread of the disease. It was soon decided that one of the first steps would be to segregate all lepers on a suitable island, where they would not endanger the remaining population. It was indeed horrible that each year more than a thousand Filipinos should contract leprosy, which, after all, is nothing more than living death, because the disease drags along for many years and the victims die usually when they contract some intercurrent malady.

Until recently, as already said, all treatments for leprosy have ended in failure. From time to time there has been an isolated case here and there reported to have been cured. But generally the diagnosis was not satisfactorily confirmed, or the question was complicated by the fact that occasionally leprosy undergoes spontaneous cure, or there were other doubts cast upon the reliability of the reports. Experience with many thousand lepers in the Philippines has shown that occasionally there are individuals who alternately recover and relapse, and during the period of temporary recovery it is impossible to make a diagnosis even by microscopical methods.

We had a recent illustration of this in our own country. The case of one victim, a man named Early, has received world-wide newspaper publicity. One set of experts declared him to have leprosy and other experts pronounced him free from the disease. It would seem quite possible that he may have been inspected by the experts at different periods of the disease and that these may have corresponded to periods of recovery and relapse. Subsequent developments have shown conclusively that he is undoubtedly a leper. That caution is necessary in announcing a cure for leprosy will, therefore, be apparent. Up to the present time no one has claimed that any considerable number of cases have been cured by any one form of treatment. It is, therefore, of more than ordinary importance that in the Philippines the use of a chaulmoogra oil mixture has resulted in the practically demonstrated cure of 6 cases and the probable cure of 23 more.

The present stage of the development of the treatment herein described does not warrant the belief that anything like a specific for leprosy has been found, but experience does show that it gives more consistently favorable results than any other that has come to our attention, and it holds out the hope of further improvement. The situation may be summed up as follows: It produces apparent cures in some cases, causes great improvement in many others, and arrests the progress of the disease in every instance in which we have tried it. Experience also shows the great desirability of further trial in the hands of other workers in different parts of the world. Finally, it is always important to remember that there are many treatments which apparently cause some improvement, and it not infrequently happens that when cases of leprosy are placed under better hygienic conditions and have hospital care the disease is often arrested, in a few instances improvement results, and apparent cures may take place without any treatment.

This treatment is only one phase of the work which the United States is doing in the Philippines for its lepers. Probably no nation does so much for these, its especially unfortunate wards. The island of Culion, which was selected as the site of the leper home of the Philippines, is a beautiful island approximately 15 by 30 miles in dimensions. It is located about 200 miles southwest of Manila and forms one of the Calamianes group. It has many fertile valleys, and the whole island is covered with an abundance of trees and tropical vegetation. The site was chosen because it was well isolated, sparsely inhabited, had plenty of good fresh water, an excellent harbor, and offered excellent opportunities for the lepers to engage in agricultural pursuits.

It is difficult to appreciate the amount of work involved in constructing a complete town on a remote and deserted island. Under natural conditions a town comes into existence over a period of years, and many private individuals are concerned in its building. To bring a complete town into being for the use of other persons has very seldom been done. It meant the laying out of streets and alleys, the building of more than 400 dwelling houses, the erection of a theater building, a town hall, a school building, a modern piped water supply, the necessary reservoirs, the installation of a sanitary sewer, the building of docks and approaches, warehouses, dining halls, hospital buildings, lighting systems, post office, store, a refuse-disposal plant, cemeteries, and the erection

of suitable buildings for nonleprous employees—in brief, all the modern conveniences that one would expect to find in any up-to-date, well-ordered town.

The work was accomplished only after many heartrendering experiences. At one time 300 laborers ran away at the first report that a shipload of lepers was to arrive on the island. It was only after a number of weeks of painstaking effort that a new supply could be secured. Skilled mechanics had no desire to undergo the isolation, some quit after a few days' work, and the class that could be induced to go often lacked skill and made blunders which sometimes took months to correct. Construction work on even smaller projects is often difficult in the United States, so that our experience on this remote island in the Pacific Ocean can perhaps better be imagined than described. There was no telegraph, and mail steamers arrived only once every three weeks. Captains of steamers carrying building materials who were unfamiliar with the port often would anchor miles away, and the supplies had to be laboriously landed in small boats. Many of the materials had to be obtained in the United States or Europe, and this alone required six months or more. Sometimes a part of a machine would be lost in transit—another six months would be needed to replace it. The colony was finally completed, and, though it is by no means perfect, it represents an amount of time, labor, thought, and perseverance that is not obvious in the finished product.

While the construction work was going on at Culion a campaign of education with regard to leprosy was conducted throughout the Philippine Islands. Upon the instance of the Governor General the provincial governors were asked to make every effort to tell the inhabitants of their Provinces a few salient facts about the manner in which the spread of the disease might be lessened. They were requested to start a campaign of education in order that the masses might learn the dangers of leprosy. They were also to inform their people that by modern methods there was reasonable hope that the number of new cases could be greatly reduced, and that by special care the course of the disease might be greatly modified and even steps taken toward a cure. A few months later a Filipino medical officer who could speak the dialect would call at the Province and give public lectures on leprosy, and often, with the aid of lantern slides, would show views of the leper colony which was then under construction. As soon as the colony was ready to receive lepers the present writer would go to such Provinces with a steamer and invite those who were afflicted with the disease to accompany him to Culion. It was hoped, by using methods of persuasion rather than of force, that much more rapid progress could be made in the segregation of the unfortunates. Furthermore, it was hoped, after the lepers arrived at Culion and found that they were provided with good food and living quarters and an ample supply of clothing, all without cost to them, that they would write home and encourage other unfortunates to come. This proved to be the case. Briefly, the great majority of the lepers in the Philippine Islands were transferred to the island of Culion without the use of force. When it is remembered that this frequently involved separating husband from wife, mother from child, brother from sister, friend from friend, and, furthermore, that family ties among Filipinos are very strong, it will be appreciated what great forbearance the Filipino public showed in not opposing this public-health measure and what it meant when they assisted to carry it into effect. In all, more than 8,000 lepers were transferred to Culion, and, so far as known, every person in the Philippine Islands who is afflicted with the disease has now been segregated. The present status of the problem is in striking contrast with that of 1906, when lepers were encountered almost everywhere without any restrictions. In a number of instances they worked in cheese factories, as salesmen in grocery stores, as coachmen, school-teachers, clerks, in tobacco factories, and at other similar pursuits. One of the gratifying results of the segregation of the lepers was the discovery of persons who were suffering from other diseases who had been classed as lepers and had been compelled to live with them. It often happened that these persons suffered from maladies that could be readily cured, and in such cases they were taken to Manila or other places for treatment, and upon their recovery they were restored to their homes and friends.

The present colony numbers about 3,500 lepers. They live in more than 400 nipa palm houses, each of which is large enough to accommodate from five to seven lepers. In addition there are reinforced concrete houses which are divided into six apartments, each of which is suitable for twelve persons. These houses are built with ventilated tile roofs and are especially adapted for housing persons afflicted with this disease; the ventilation is of particular impor-

tance because the disease gives rise to very unpleasant odors. In front of each house is a small flower garden, and every effort is being made to instill sufficient civic pride in the lepers to maintain them; but so far these efforts have not met with much success.

The lepers are given all possible liberty, and to a large extent are controlled by regulations which they themselves make. They are allowed to punish offenders against their own regulations. They are privileged to elect their own mayor and councilmen. A police force composed entirely of lepers has been organized, and it is its duty to see that the town is kept in good sanitary condition as well as to make arrests of offenders against their own ordinances. Each councilman is responsible for the proper housing, good order, and adjustment of complaints of the people in the section of the town which he represents.

The question of the lepers contributing something toward their own support has received most careful attention, but on closer consideration it has been found that not much assistance in this direction can be expected. The disease soon produces contractions of the limbs, destruction of tissue, losses of fingers and toes, nervous involvements which result in loss of muscular power, and general debility. Only a small proportion of them are capable of performing sufficient manual labor necessary to supply food for themselves. There are many lighter occupations in which a fair percentage could engage, yet the articles produced would not be of a kind useful to themselves. The repugnance which the public has for things handled by lepers, even though rendered safe by sterilization, would preclude the possibility of selling these products at a profit. Then again, so many of them are bedfast, and the wounds and ulcers of others require so much attention, that many of those not yet so badly afflicted must devote their time to those not so fortunately situated. Domestic duties, cooking, the making of clothes, laundry work, cleaning, the care of streets, and the repairing of buildings require the entire time of many more, so that the sum total of the remaining effective labor is very small.

The question of raising cattle is now under consideration. Apparently this should be a light occupation in which our lepers might be successful. On account of the fact that cattle do not contract leprosy, it would seem that the public would not object to the meat of such animals if it were placed upon the market.

At first it was hoped that the able-bodied lepers would be glad to perform such tasks as might be assigned to them, but it was soon found that even a leper who receives free board, lodging, hospital care, and clothing from the Government does not care to work for that Government without receiving compensation, notwithstanding that the labor is for his own benefit. There are many things to be done each day in Culion. The streets must be swept, the garbage cans emptied, assistance rendered in the hospital, and supplies carried. Each leper thinks it is the duty of the other to do the work, and so it goes in an endless circle. To meet this difficulty it seemed desirable to change artificial conditions of institutional life more nearly to resemble the conditions prevailing in ordinary communities. With this end in view, a store has now been started at which anything produced by a leper may be sold. There is also kept for sale a stock of such things as the lepers may wish to buy. This store is beginning to exert a very favorable influence. For example, nearly a ton of fish is offered for sale by the lepers every day. Milk from the goats and special vegetables may now be obtained for the sick. In connection with the store there is a post office, with a leper postmaster in charge. All outgoing mail is disinfected. When it is ready, a nonleprous employee collects it and places it aboard the mail steamer.

A special currency has been coined for the exclusive use of the lepers. The denominations are the same as those of the regular Philippine currency. If a leper has occasion to send money out of the colony, he can purchase a regular money order from a nonleprous clerk, who mails it for him.

Briefly, then, the United States has established the world's largest leper colony. In the course of a few years the feat of gathering up more than 8,000 lepers has been accomplished without creating any serious disturbance. The treatment for leprosy has been greatly advanced. The lepers themselves, instead of being shunned, often wanting for food, and driven from pillar to post, now have a comfortable home where they are welcome. And finally, due to the decreasing number of new cases, hundreds of unfortunates who were formerly doomed each year to contract this most loathsome disease are now saved from this horror.

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Mr. DANNER. I should like also, for the information of the committee, to call attention to a United States Public Health Service Report, Supplement No. 20, issued October 16, 1914. Will the members of the committee note one picture opposite page 14 of this report, showing the results of the Chaulmoogra oil treatment; the change in the appearance of the leper is shown by the pictures opposite page 15.

Neither Dr. Heiser nor anyone else, so far as I know, has claimed that this is an absolute cure. It may only arrest the disease. Whether leprosy will recur can only be determined by observation through a long period of time. However, the last time I talked with Dr. Heiser he told me that 7 cases had taken the treatment in which all evidences of the disease had disappeared for more than three years, and 23 cases had lost all trace of the disease and been apparently cured for two years, and that 200 additional cases had been substantially improved. The remedy has shown uniformly wonderful advantages to all the patients who have taken it.

If I needed any further reason to convince me that this legislation is needed I would find it in the appearance here to-day of the busy specialists from New Orleans, Minnesota, Missouri, New York, Massachusetts, Maryland, and elsewhere. If these men, from their own professional relation to leprosy, deemed the national leprosarium a feasible method for the care of lepers, surely their opinions should be regarded as evidence unmistakable in its importance.

These pictures showing types of leprosy and some asylum buildings, which I leave with the committee, are so marked that each one tells its own story. Dr. Dyer referred this morning to the little chapel for lepers. There is a beautiful little Catholic chapel and a very pretty little Protestant chapel for the lepers at this Louisiana station. I would like to go on record as expressing my hearty admiration for the perfectly wonderful way in which the sisters at Carville, La., take care of the lepers there.

The CHAIRMAN. What sisters are those? What order?

Dr. DYER. St. Vincent de Paul.

Mr. DANNER. I said to one of the sisters, after she had dressed a very bad case in my presence, and the patient had been wheeled away in his chair, "Does this case disturb you much?" and she said, "Not now; it used to, but the mosquitoes bother me more now." These nurses are earnest and faithful in the illustration of love for this work.

May I submit a letter, Senator Ransdell, which I received this morning at your office from Dr. Conley, of the New York department of public charities? He is superintendent of the Metropolitan Hospital and has special supervision of the lepers.

The CHAIRMAN. Yes.

(The letter referred to is here printed in full, as follows:)

DEPARTMENT OF PUBLIC CHARITIES,
New York, February 11, 1916.

Mr. W. M. DANNER,
United States Senate Building, Washington, D. C.

MY DEAR MR. DANNER: Yours of February 9 just received. It will be impossible for me to go to Washington on Tuesday next, although I would like to very much.

I do not see how there can be any argument against the establishment of the leprosarium, and I think everything is in favor of such an institution.

At the present time we have eight lepers in this hospital, one having died a few weeks ago. In the City Hospital there are two and in the Kings County Hospital, Brooklyn, one. I do not believe that there are any others in any of the hospitals in the city of New York, although there may be many wandering about at large in the city.

I have just called up the contagious division of the department of health and asked them for the number of lepers in the city of which they have a record, and I find it to be 8 in addition to the 11 above mentioned, and they estimate that there are about 50 in Greater New York. Of course, outside of the 19 known cases, it is simply an estimate.

Hoping that you will be able to show the Senate committee that it is an absolute necessity, I remain,

Sincerely, yours,

WALTER F. CONLEY,
Medical Superintendent.

Mr. DANNER. I should like also to call the attention of the committee to the Public Health Report for 1906.

(The report referred to is here printed in full, as follows:)

NECESSITY OF A HOME FOR LEPERS IN THE UNITED STATES.

[Report for 1906. (P. 216—Public Health and Marine-Hospital Service).]

While on the subject of leprosy, it is pertinent here to narrate certain events during the past year which emphasize the necessity of a home for lepers under Government control. It will be recalled that a bill for the establishment of such a home was introduced in the Fifty-eighth Congress. This bill was passed by the Senate, was reported on favorably by the House Committee on Interstate and Foreign Commerce, but on the last day of the session failed to pass the House.

In June, 1906, there arrived at Elkins, W. Va., where two of his brothers lived, M. R., a native of Syria. He had landed at New York from Beirut in 1902, at the age of 17. Two years after landing in American he developed symptoms of leprosy. For some time he worked in a cotton factory in Maine, until he was physically unable to work longer.

Three weeks after his arrival at Elkins, W. Va., the city health officer recognized the case as one of undoubted leprosy. The said health officer reported the case to the secretary of the State board of health, who in turn reported it to the bureau by telegraph and requested advice as to his disposition. Reply was sent that the patient did not come within the provisions of the immigration law relating to deportation, the time limit within which he could be deported having expired; that there was no national leper home to which he could be sent; and that there was no appropriation under which he could be cared for by the service.

The patient desired to return to Syria, and undertook to reach New York by the Baltimore & Ohio Railroad, but according to press accounts was turned back at Philadelphia, and was switched off in a freight car onto a siding at Golden Oak, Md. He was cared for by the Maryland authorities at this point for a while, and then returned by them to West Virginia, arriving at Parkersburg July 31. By the West Virginia authorities he was sent to Pickens, in that State, and isolated near that town under care of the State board of health, a physician being appointed to care for him.

The bureau was appealed to from several sources to do something for this leper, and in each instance a reply was sent that officially the bureau had no power nor responsibility in the matter. However, the matter was taken up privately between the Surgeon General, the secretary of the State board of health, of Maryland, and the quarantine officer of the port of New York. A movement had been started among the Syrians and others benevolently inclined for the collection of a fund sufficient to secure transportation back to the land of his nativity, to which he was eager to go, believing there he would find a cure for his disease.

Through the efforts of the secretary of the State board of health of Maryland and others a sufficient fund was raised, and on being informed to this effect, I communicated with the quarantine officer at New York, who endeavored to arrange for the transportation of the leper with an attendant on some steamer bound for Alexandria, Egypt, from which city the leper could doubtless find

his way to Beirut. Before the necessary arrangements could be completed, however, death ended the sufferings of this unfortunate person October 20.

The newspapers were full of the hardships encountered by this leper in being bandied from place to place, isolated, and an object of aversion wherever he went, the spectacle being one discreditable to the country.

Mr. DANNER. This report cites the cases of a number of lepers with very unfortunate treatment, including the one discovered at Elkins, W. Va., whose death soon followed his experiences of suffering and terminated his case.

One of my friends said to me the other day that I was altogether too insistent for a national leprosarium; that if there were approximately 500, and perhaps a thousand, lepers in this country, he thought I was unnecessarily alarmed and out of order in urging any kind of national legislation for the lepers. I told him we were not trying to fight a battle with a chance of losing, but that by segregation leprosy had been stamped out of Great Britain and almost out of Norway and greatly reduced in the Philippines. He still said, "I think you are too insistent about this question, if there are only 500 lepers, or even a thousand, in this country." I said to him, "Will you tell me what you would do if your house was on fire?" He said, "I would send for the fire department." I said, "Suppose the fire had only started, when would you send for the fire department?" He said, "Right away." I said, "Why not wait until the fire had gotten a good start, then call your fire department, so as to show what an efficient fire department you had?"

With assurance that segregating the lepers will accomplish within our own generation the absolute elimination of leprosy from this whole Nation, is it not worth while to do it now?

Senator WORKS. This bill does not provide any means by which the Government can compel lepers to submit to the treatment, does it?

The CHAIRMAN. No, sir; it does not.

Senator WORKS. Do you not think the bill itself ought to provide something of that kind, if this sanitarium is to be established—some authority given to compel the lepers to go to the sanitarium when they are apprehended?

The CHAIRMAN. I was under the impression that that would have to come from the local or State authorities.

Senator WORKS. No; I do not think so.

Mr. DANNER. Following the line of what Dr. Dyer said this morning, might I give some information secured by correspondence with our oriental stations?

The CHAIRMAN. Yes.

Mr. DANNER. The Mission to Lepers engaged a Mr. W. H. P. Anderson, of Boston, 10 years ago to take charge of the second largest oriental leper mission asylum in the world. There was no law compelling lepers to come into this station. Our mission maintains a large number of these asylums. There are Government asylums also. It was found after a few years that the mission asylums were usually overcrowded, while the Government asylums usually had vacant beds. Investigation of the station supervised by Mr. Anderson disclosed the fact that forcing lepers into an asylum was sometimes less effective than offering the inducements of sympathy and mercy and a chance to get well. Since talking with one of the

doctors here this morning I have quite reached the conclusion that the opportunity for people in this country to get well, to have proper treatment, and to have a sympathetic appreciation of their real condition, would be so much appreciated that the average person with leprosy would not have to be compelled to go into a national leprosarium, but would be glad of an opportunity to enter such a door of hope.

Senator WORKS. That might be if it were confined to a narrow territory, but taking the country over I should think there would be some question about it. If the National Government has no power to compel these people to go to the asylum, if it be established, then the Government would have no authority to deal with it at all, and the mere appropriation for the sanitarium itself would be beyond the jurisdiction of the Federal Government.

The CHAIRMAN. The question of the constitutional right we will have to discuss among ourselves.

Senator WORKS. Yes; but that is a matter about which I am in some doubt.

The CHAIRMAN. Yes; we will have to study that. I would like to state that I visited John Early, this Washington leper, on Sunday last with Dr. Fowler and my assistant secretary, Joseph M. Rault. I asked him what he thought of a national home and whether it would be used. He seemed perfectly delighted with the idea of having one and said he would go to it with the greatest of pleasure; that the condition he was now in was "hell," although he was not complaining in the slightest way of his treatment, for he seemed to be as kindly treated as conditions will permit, but it was simply horrible, and, to use his own language, it was "hell," and he said that he and every other poor leper in the United States, in his judgment, would be delighted to go to a national home, where they would have a great many comforts and at least companionship. I think that is worth putting down as the testimony of a man who is himself a leper and a man of some intelligence and who has gone through terrible suffering.

Senator WORKS. Mr. Danner may be entirely right about that matter. I imagine a great many of them would go voluntarily and gladly in their condition, but still I think the authority should be provided to compel those who may not be willing to go to do so. You would probably have some of them who would not go willingly.

Mr. DANNER. I think that the point is well taken and that if it is possible to have authority it should be had, and then use all the persuasion that is possible.

Senator WORKS. Oh, no; I do not think force should be used except as a very last resort.

The CHAIRMAN. If I understood Dr. Dyer correctly, in Louisiana they are compelled to go there.

Dr. DYER. Twenty per cent are compelled to go, and 80 per cent go voluntarily.

The CHAIRMAN. But the authority exists in the law to force them to go?

Dr. DYER. Yes; exactly as an insane person. They are brought before a judge in chambers or in his court.

The CHAIRMAN. And the judge orders them to go there?

Dr. DYER. Yes.

The CHAIRMAN. So they have the same machinery there as for committing an insane person?

Senator WORKS. I am not sure but what this bill does give that authority. Look at section three.

The CHAIRMAN. That is after they get there. That is the way I construe that.

Senator WORKS. No; the apprehension, I suppose.

The CHAIRMAN. Perhaps that would apply to any part of the United States. That is a question we can study later and act upon. Dr. Fulton, will you please come forward. You are the secretary of the State Board of Health of Maryland?

Dr. FULTON. Yes, sir.

STATEMENT OF DR. JOHN S. FULTON, SECRETARY OF THE STATE BOARD OF HEALTH OF MARYLAND.

The CHAIRMAN. Doctor, will you please give us your impressions of this subject and state first what experience you have had with leprosy?

Dr. FULTON. I have had no important experience with leprosy. I am familiar with this legislation, however, during some 16 or 18 years, when it has been either before Congress or in process of preparation, and I have frequently been present when the subject was under discussion among the health officials of the country.

I come from a State which has no leprosy, so far as we are aware. There have been three cases of leprosy in the State of Maryland within the last 16 years, and their history is the best illustration I can give of the necessity for such legislation as this bill contemplates.

The first of these cases was a citizen of Pennsylvania—M. S. She lived in Pittsburgh or Pennsylvania and came to Baltimore in 1897 or 1898. Having some skin disease about which physicians were puzzled, she went to the Johns Hopkins Hospital to find out what was the matter with her. Her trouble was recognized as leprosy, and due notice was given to the health authorities.

The city authorities had an old brick building on the abandoned quarantine grounds. This building was renovated and made ready for the care of M. S., when an improvement association prayed the courts to enjoin the city from using this building or the grounds for the care of a leper. A preliminary injunction was granted and after trial the injunction was made permanent.

Meanwhile Mrs. S. remained in Johns Hopkins Hospital. If the hospital authorities had allowed M. S. to go, it is probable that the city authorities would have taken no notice of her departure. The hospital authorities elected to keep her, however, and she remained there for several years.

The city incurred no expenses for her maintenance; she was supported wholly by the hospital; nobody went to see her but the medical men and the students who wished to study leprosy, and the nurses; she never put her foot on grass, nor saw more sky than you can see through these windows, and there she died.

The next case of leprosy was one of those mentioned a few minutes ago by Mr. Danner. He was a Syrian about 22 years old, named M. R., who became notorious throughout the country under the name

of Rossett. He achieved this fame in about 2 weeks, and survived about 12 weeks. He came to my attention in June, 1906. R. had lived in Maine. For a while he was a peddler, and for a year he worked in a cotton mill at Waterville, Me. Subsequently he lived in Michigan City, Ind., in Uniontown, Pa., Enterprise, W. Va., Clarksburg, Philippi, and Elkins, W. Va. He consulted many physicians about a chronic skin disease. In June, 1906, he consulted Dr. W. W. Golden, of Elkins, who recognized tubercular leprosy. Several physicians saw the case and were greatly interested. The case was of such interest that R. was taken to the meeting of the Medical Society of Barbour, Randolph, and Tucker Counties on July 2, to illustrate a clinic on leprosy, probably the first clinic of the kind ever held in West Virginia. Subsequently a sum of money was raised to send R. and his brother to New York. It does not appear that this was done officially, or with any attempt at secrecy. Quite the contrary. R. and his brother went as ordinary passengers on an accommodation train. According to accounts it was a great journey. The news traveled faster than the train. It is said that people came to the stations to see the leper, and at several stations physicians boarded the train and examined the man. The "big noise" reached Cumberland in time to stir up the authorities. In time also for R. and his brother to be warned that they would not be allowed to enter Maryland. They left the train probably before the train reached the Maryland line. He and his bother eluded the authorities, which was perhaps not difficult, for it was night when the train reached Cumberland. The brothers were separated, however, and R. boarded a Baltimore & Ohio freight train for New York. He was penniless, for his lost brother carried the funds.

Next day the Maryland authorities learned from the Pennsylvania authorities that the car carrying R. had been detached and coupled to a westbound freight train. The Baltimore authorities forbade the railroad to bring that car to Baltimore. Accordingly the car was left on a siding at a lonely station, Golden Ring, Baltimore County, and there we found him.

Under the conditions of Maryland law, the only place where a leper can be kept is the spot where he is found, and the cost of his maintenance is a charge upon the local authorities; in this case the county commissioners of Baltimore.

On this spot R. became famous from end to end of the country. Newspaper notoriety was the chief obstacle to the final disposition of the case by the Maryland authorities.

We broke most of the laws of decency and humanity in handling this leper. Nobody was consulted or informed. Everybody was encouraged to look in some wrong direction. R. himself was obedient as a dog, and as trustful. He was carried back to West Virginia on the Cincinnati express as an ordinary passenger, disguised very simply by means of an accordion. Every member of the State Board of Health of West Virginia was informed by wire in time to have taken R. in charge at any point from Rowlesburg, 6 miles across the State line, where a member of the State board of health lived, to Clarksburg, which was R.'s destination, and the home of the president of the board. We also sent telegrams to all of the surrounding States informing them that we had returned R. to West Virginia. At the time we believed that West Virginia had deliberately tried to

shift the responsibility to some other State and might do so again. In this, of course, we were mistaken.

We applied to the United States Public Health Service for relief, and wrote to the West Virginia authorities offering to cooperate in an effort to send R. back to this native country, which would have been the thing he most desired. The United States Public Health Service could have deported him, and the arrangements were about complete when R. died on a mountain side not far from where his journey began.

To me this is a harrowing story. No one of humane feelings could be otherwise than in contempt of himself for having recourse to such methods in such a situation.

The CHAIRMAN. What was the length of time from his leaving West Virginia, in the first instance, until he died?

Dr. FULTON. He was sidetracked at Golden Ring on July 22, I think, and was back in West Virginia on August 1. He died on October 19.

The CHAIRMAN. He died in West Virginia?

Dr. FULTON. Yes; in West Virginia.

The CHAIRMAN. Do you know what was done with him in West Virginia, Doctor?

Dr. FULTON. He was put off the train at Parkersburg and he was taken up to Pickens, in Randolph County, where a cabin on the mountain side was devoted to his use. I suppose they treated him all right; and if he had lived six weeks longer the Surgeon General would have put him on a ship and returned him to his own country.

The last of the cases known to me was that of a young Italian woman named M. She had been living in Baltimore three or four years and possibly developed the disease in Baltimore, though it was said that she had some skin trouble when she arrived at the port of New York.

She went to Johns Hopkins Dispensary. Her disease was recognized, and she became a regular dispensary patient. The health authorities were aware of the facts. She could have continued as a dispensary patient but for the action of her neighbors.

The case soon became known through the newspapers. The health authorities were obliged to provide for her custody. A little house was built for her at the present quarantine station, and she lived there about 13 months. Her husband then secured, through the courts, her release into his care, on condition that he would take her out of Maryland. This occurred on July 21, 1911. They could have easily left Maryland, and probably did. At all events, we know no more about Mrs. M., and we believe that there is no leprosy in Maryland.

It would seem absurd for the State to support a leprosarium, when we have no lepers and do not want any. The argument for a national leprosarium is the humane argument. Everywhere a leper is not only an object of fear, but also of curiosity. Lepers can only find out how inhospitable and how inhumane we are by traveling, as so many have done, from State to State, seeking rest and finding none.

At the conclusion of the R. incident, I said in a Baltimore newspaper that our behavior in the R. case was, from the scientific standpoint, absurd, and from the viewpoint of humaneness, contemptible.

The CHAIRMAN. How do you feel, Doctor, toward the passage of such a bill as this, and how does the profession in your State feel in regard to it?

Dr. FULTON. I am very much in favor of the passage of a bill of this sort. I do not think the profession in my State is very sensitive on the subject. Their experience is not such as to arouse them. At the Johns Hopkins Hospital, however, you would find a vigorous sentiment in favor of this legislation. They had to carry the whole load—service, sympathy, and cost—in the case of M. S.

The CHAIRMAN. Have you any other suggestion to make, Doctor?

Dr. FULTON. No; I have not.

The CHAIRMAN. We are very much obliged to you, Doctor.

Dr. FULTON. Not at all.

The CHAIRMAN. Dr. Hoffman, we will hear you now.

STATEMENT OF FREDERICK L. HOFFMAN, LL. D., STATISTICIAN, THE PRUDENTIAL INSURANCE CO. OF AMERICA, NEWARK, N. J.

The CHAIRMAN. Doctor, I will ask you to please discuss this question in your own way.

Dr. HOFFMAN. I have taken note of what has already been said in evidence, and I will try to answer some of the questions that have been raised, particularly by Senator Works. At the outset, however, I would like to explain my own interest in this matter, which extends over about 20 years, and which has included visits to the leper settlements at Molokai and in Louisiana, as well as to the isolation hospital at San Francisco, where some 15 cases are being taken care of. I have also seen isolated cases of leprosy, including the two patients for some time under confinement here in Washington. I have, therefore, the advantage of a fairly extended personal knowledge of actual cases, but, in addition thereto, I have quite extensively considered the statistics of leprosy throughout the United States and the remainder of the civilized world, with the result that I am absolutely convinced of the gradual increase of leprosy in this country in the absence of effective segregation. And I desire to impress upon you, Mr. Chairman, and upon your committee, the profound conviction that leprosy in America is a much more serious menace to the public than is generally assumed to be the case.

By way of illustration of the ever-present menace of leprosy, I would submit for inclusion in the record the following case reported in the New York Sun of this morning from Brooklyn, N. Y.:

> Tillie Davis, 18 years old, who died on Saturday in the Kings County Hospital and was buried yesterday in Mount Sinai Cemetery, was a victim of leprosy, according to the coroner's certificate. She was admitted to the hospital 10 months ago. About a year prior to that she came from Key West, where her parents live, to join a sister in Brooklyn.
>
> Deputy Supt. Price of the hospital said that when the girl was taken to the hospital the diagnosis showed that she was suffering from leprosy and internal ulcer.
>
> "We isolated her," Mr. Price said, "as much as possible. Men suffering from leprosy are sent to an isolated section of Blackwells Island, but no provision is made for women. Her condition did not develop sufficiently to threaten inoculation of other patients."

Only two weeks ago, under date of February 1, 1916, the New York Sun published the following account of a case of leprosy discovered in Jersey City:

Magdelina McLean, 17 years old, was taken from her home at 930 Westside Avenue, Jersey City, yesterday to the Hudson County Contagious Diseases Colony at Snake Hill, a victim of leprosy. The health authorities had just received their first knowledge of the case, although the girl had been suffering from the disease for five years.

When the girl's parents learned the nature of the disease they placed one room in their apartment under quarantine. Care was taken to see that nobody touched anything with which the girl's hands might have come in contact, and other members of the family were saved from contracting the disease. The girl was a pupil in public school No. 23 and a member of St. John's Episcopal Sunday School when stricken.

Physicians say that her case is too far advanced to make a cure possible.

Cases of this nature are sufficiently common to demand consideration. The history of the cases found at large is almost invariably to the effect that the disease was not recognized in its early stages, and that therefore there had been more or less promiscuous contact with the public, at the serious risk of infection. There are reasons, therefore, for believing that there are many more foci of leprosy in this country than we have positive knowledge of. Almost invariably when such cases are discovered proof is forthcoming of some antecedent connection with a case of leprosy or exposure to the disease in some focus of infection, chiefly the Philippines, Hawaii, Cuba, the West Indies, etc.

This bill, or rather the principle of this bill, has the official indorsement of the American Dermatological Association, the American Medical Association, the American Academy of Medicine, and the Thirteenth Annual Conference of State and Territorial Health Officers with the United States Public Health Service. With your permission, I shall read to you a resolution which I introduced at the last meeting of the conference and which, on motion of Dr. Dowling, State health officer of Louisiana, seconded by Dr. Hurty, the health officer of Indiana, was unanimously adopted:

Whereas leprosy exists or occurs in practically every State and Territory of the United States; and

Whereas there are only three public leprosaria under State control in the United States; and

Whereas there is no concerted movement on foot for the Federal control of leprosy: Therefore be it

Resolved, That this conference regards leprosy as a national problem and recommends to Congress the establishment of national leper homes in various parts of the United States in order that lepers may be effectively isolated and receive humanitarian treatment and that the spread of the disease may be effectively checked.

I subsequently had occasion to present a similar resolution at the meeting of the American Academy of Medicine, held in San Francisco, which was also unanimously adopted. Before presenting my resolution I had entered into correspondence with nearly every State health officer in this country, and I have here with me the letters received in reply to a circular request for information, including a number of letters from health officers of large municipalities. With a single exception, all of the letters are in favor of the principle of this bill, as incorporated in my question, "Are you in favor of a national leprosarium to provide for the adequate treatment and care of at least such lepers as are apprehended by the authorities

while in interstate transit and which are probably the only cases which at the present time can be properly taken care of by the Government?"

The CHAIRMAN. Did all of your correspondents reply to your inquiry?

Dr. HOFFMAN. Practically all were good enough to do so. A few made no reply, probably because no leprosy existed in the State or municipality concerned. In summarizing the results I find that 39 State health officers replied in the affirmative and only 1—California—replied in the negative. That health officer, however, is no longer connected with the California State Board of Health. What the attitude of the present officer is I do not know.

The CHAIRMAN. These are the replies of the health officers of 39 States?

Dr. HOFFMAN. Yes: the official health officers of 39 States, without qualification, indorsed the principle of this bill as set forth in the question contained in my circular letter of inquiry.

The CHAIRMAN. Was there any objection urged to the bill?

Dr. HOFFMAN. No specific objection was raised by anyone further than that the State health officer of California in office at the time simply replied in the negative. With your permission, I would like to incorporate in the record the following extracts from some of the letters received.

The secretary of the State Board of Health of Illinois replies:

"This board favors the establishment of an institution in which proper care of lepers may be taken. As an instance in which such an institution would have been of practical service, I would respectfully recall the experience of the city of Highland Park, Ill."

Dr. Hurty, State health officer of Indiana, writes as follows:

"I believe that segregation in all cases is advisable. Lepers should not be at large in the community. I favor a national leprosarium. Leprosy is a national problem, on account of its unusual features and the history of the disease."

The State health commissioner of Oklahoma writes as follows:

"Two cases of leprosy were reported to me and both were negroes. Both had come from New Orleans and both had spent several years in Mexico. One was discovered first in the State penitentiary, and he subsequently escaped. The guards were very much afraid of him. The other was a pauper on a poor farm, where he died. I am confident that there are many more lepers than we have any knowledge of. The lack of proper and humane places where they can be cared for causes them and their families to keep the knowledge of their trouble to themselves. The Government should provide a place for these unfortunates. There are too few in most of our States for the State to recognize its responsibility in leprosy. The United States Government can care for all of these and should provide a hospital for them, and that at once."

The director of Public Health and Charities of Philadelphia states that he favors segregation for all lepers, and he adds:

"The manner in which lepers are shunned is not a credit to an intelligent people. It would be ideal to have a national leprosarium; but it probably is not feasible on account of functions required of each State."

The secretary of the State Board of Health of Utah writes that he is "emphatically in favor of a national leprosarium."

The acting commissioner of health of the city of Seattle replies:

We think there should be a national leprosarium, and we are also of the opinion that arrangements should be made whereby the State and city authori-

ties could transfer all cases of leprosy to this institution. The writer is more or less familiar with leprosy problems, having lived in the Hawaiian Islands three and a half years.

The secretary of the State Board of Health of Wisconsin replies:

We are very much in favor of a national leprosarium, as it is always a difficult matter to properly segregate and provide for the treatment of unknown cases when discovered. As a result there is a constant temptation to either deport the cases or allow them to leave voluntarily, so that they will pass out of the jurisdiction where found. This we believe is very undesirable.

I have also here a letter from the secretary to the commissioner of health of the city of New York, who, in answer to a letter of mine dated February 9, 1916, writes:

The records of this department show 24 cases of leprosy in this city at the present time.

The secretary refers to the weekly bulletin of the department for October 30, 1915, in which is stated the official attitude of the department with reference to leprosy cases, it being held that "patients with suitable home surroundings, and where hygienic precautions are preserved, may be permitted to remain at their homes." Furthermore, it is said that "it is an accepted fact among physicians that the danger of transmitting leprosy in this climate is small, though there appears to be some danger in the South. When the leper has no open lesions and no discharge from the nose it is safe for him to be at large. A leper with open lesions, if careful and if home conditions are suitable, may be safely segregated in the home."

I would respectfully suggest, Mr. Chairman, that you request the official opinion of the Surgeon General of the United States Public Health Service as to whether these general and apparently extremely superficial precautions afford adequate protection to the public. I may be permitted to add in this connection that, so far as known, there is no direct relation between climate and leprosy occurrence, since the disease is met with in all climates, from Iceland to the Tropics.

Unless there is effective segregation and otherwise adequate provision for the care of lepers, it is extremely difficult, if not impossible, to ascertain the number of lepers in the community. According to the replies received from the health officers referred to, there are about 150 lepers known to be in the United States at the present time; but there is no question of doubt, in my own mind, that there are certainly three times as many lepers in this country, if not more.

Under date of May 15, 1915, or less than a year ago, the Lancet Clinic, an important medical paper contained the statement that "Eighty lepers walk the streets of Chicago daily." This statement was made by Dr. George A. Zeller, a member of the Illinois State Board of Administration, while in Chicago for the purpose of examining Angelo Lunardi, a leper found at Highland Park.

In reply to an inquiry of mine to the commissioner of health of Chicago, Dr. Bertson was good enough to wire me as follows: "Skin specialists of Chicago concur in Dr. Zeller's statement. Three cases of leprosy reported to department of health in 1915. All three isolated."

In the absence of adequate provision for the humane care of lepers under suitable conditions, many leprosy cases are unquestionably hidden and kept out of public notice, as best illustrated in the

Jersey City case, previously referred to. During recent years I have collected quite a number of individual cases, emphasizing the inhuman and often brutal and uncivilized treatment of lepers in this country, who are apprehended, transported, and isolated, frequently under most trying conditions.

The CHAIRMAN. Could you give us just a few of these cases?

Dr. HOFFMAN. I am pleased to say that I have the records with me, and shall be very glad to do so.

Senator WORKS. That, I presume, results more from the fear of contagion.

Dr. HOFFMAN. It is not so much the fear of contagion as it is the ignorance of the general public regarding the disease and the helplessness of the communities concerned as regards the best course to pursue. Where these isolated cases occur the community is, as a general rule, entirely unprovided with suitable facilities for treatment and care, and absolute isolation in the case of a single leper is without doubt an act of inhumanity in itself and a method precluding proper treatment, with the possible chance of an arrest of the disease and the more remote possibility of a cure.

Through the courtesy of the board of health of the city of San Francisco, I have obtained a copy of the entire official record of the notorious Grable case, than which there is no more conclusive evidence to be had in favor of this bill and the principle of a Federal leprosarium. E. R. Grable originally came from Pocatello, Idaho, on June 30, 1911, direct to San Francisco with an obvious case of leprosy, diagnosed by Dr. Blue on the first examination. He was admitted to the isolation hospital where the San Francisco lepers are cared for, and he thereupon became a charge upon the community, in no wise responsible for his condition, the disease having been contracted in the Philippines. All efforts to return him to Idaho proved unsuccessful, and equally so was an effort to have him cared for at the Federal quarantine station at Port Townsend, Wash. Grable absconded from the San Francisco isolation hospital in December, 1912, but in May, 1913, he applied again for admission, having in the meantime worked at his old occupation of railroading. Grable absconded again on September 9, 1913, and he was next heard from at St. Louis. Subsequently he appeared at Washington, D. C., where he was cared for for some time, absconding again to return to St. Louis, and subsequently to be cared for at Koch, Mo., where he is at the present time, according to an official statement by the health officer of the District of Columbia. Since his first apprehension in San Francisco, Grable had traveled extensively, apparently on a membership card of a railway union, visiting many other places—Salt Lake City, St. Louis, and points in Canada.

Senator WORKS. How did he get away from San Francisco? Did he escape?

Dr. HOFFMAN. Yes; he escaped, or more properly, perhaps, he absconded. The conditions of segregation at San Francisco are, fortunately, such as to have the least semblance to imprisonment or forcible detention. The hospital is surrounded by a wall, but escape would not be very difficult, in an emergency. It is the general experience at well-conducted leper settlements that few of the inmates even desire to leave. At the San Francisco isolation hospital lepers

are cared for in a humane manner and without risk to the community, although the institution is located within the city limits. There is no outcry against their care and detention such as has been common in the case of communities not familiar with the urgency of effective segregation. Nothing is left undone to make the conditions of existence as bearable and even as pleasant as possible. I can not speak too highly of the excellent work which is being done by Dr. A. A. O'Neill, the physician in charge. Each leper is allowed a room to himself and he has absolute freedom to do what he pleases. All who are able are more or less occupied at light labor suitable to their condition, but of their own free choice.

Senator WORKS. Do you know how many lepers there are at San Francisco at the present time?

Dr. HOFFMAN. Yes, Senator; I have here a special return which I would like to introduce in evidence, furnished through the courtesy of Dr. O'Neill, showing that at the present time 15 lepers are being cared for, including 3 ex-soldiers with former experience in the Philippines. The list is as follows, but in place of the name I give only the initials:

List of leper patients at isolation hospital, San Francisco, Cal.

Initials.	Age.	Place of birth.	Sex.	Type of disease.	Probable duration.	Admission to hospital.	Last residence.
					Years.		
O. T.	12	Manila, P. I.	Male	Mixed	2	Nov. 5, 1915	Vallejo, Cal.
F. W. L.*	57	Troy, Kans.	do.	Tubercular	5	Dec. 15, 1915	Soldier's Home, Yountville, Cal.
M. V.	34	Greece	do.	do.	5	Dec. 16, 1912	San Francisco.
P. P.	40	Mexico	do.	Nerve	27	Mar. 2, 1890	Do.
D. R.	30	Greece	do.	Tubercular	7	June 7, 1911	Do.
W. L.	35	Honolulu, H. T.	do.	do.	7	Apr. 27, 1912	Do.
J. P.	35	Hilo, H. T.	do.	do.	10	June 24, 1908	Do.
P. P.	41	Greece	do.	do.	10	Apr. 25, 1908	Do.
S. J. (negro)*	62	Maryland	do.	do.	12	June 24, 1908	Berkeley, Cal.
F. S.	29	China	do.	Nerve	(?)	May 15, 1911	San Francisco.
H. G.	57	do.	do.	do.	18	Apr. —, 1896	Do.
L. H.	60	do.	do.	do.	(?)	—, 1897	Do.
Y. F.	59	do.	do.	Tubercular	(?)	Mar. 2, 1903	Do.
F. G.	48	do.	do.	do.	(?)	Oct. 2, 1902	Do.
E. M. N.*	40	Ohio	do.	do.	1	Feb. 12, 1916	Norwalk, Ohio.

* Those marked thus (*) are ex-soldiers, I have examined four others.—Dr. O'Neill.

I have also here a statement from the secretary of the State Board of Health of California to the effect that there are about 30 known cases of leprosy in the State.

The CHAIRMAN. Will you not describe the method of segregation followed at San Francisco, of which you speak so highly, a little more in detail?

Dr. HOFFMAN. The point, Senator, is this: That the practical question which will confront your committee in connection with this bill is, Where is the Federal leprosarium to be located? You will everywhere meet with a hue and cry that nobody wants these lepers; that nobody wants such a colony on account of the possible risk to the community. As a matter of fact there is no risk to the surrounding community in the case of a leper settlement, under proper conditions of segregation. The Molokai settlement occupies only a small area

of the island of Molokai, which is extensively cultivated for plantation purposes, and where there is no record of infection having spread from the settlement to the community. The reason why the San Francisco institution is so particularly deserving of consideration is that the same is located within the city limits, with reasonably satisfactory conditions of treatment and care, excepting, perhaps, that more help might be provided to relieve Dr. O'Neill of a heavy burden, which, however, is cheerfully borne. There is no evidence that during the years since the settlement has been in existence any infection whatsoever has been spread to the adjoining neighborhood. There is sufficient space for some of the lepers to cultivate a small garden. One Chinese leper, although in a fairly advanced stage of the disease, has built himself an artificial fish pond. Another leper has done excellent work in the raising of vegetables and fruits, in conformity to advanced principles of intensive agriculture. A Japanese leper is an expert carpenter and he has furnished his room in a most attractive manner. There is entire harmony among the lepers and each one helps the other as far as is practicable. One of the lepers is entirely blind, but he still performs a considerable amount of useful work.

You will note by reference to the list that five of the patients under treatment at the present time were born in China, three were born in Greece, two in Hawaii, one in Mexico. one in the Philippines, and three in the United States, respectively, Kansas, Maryland, and Ohio. Not a single one of the patients was born in California; nearly all of them have a record of previous exposure in a known foci of infection.

The Massachusetts settlement is on Penikese Island, in the very heart of the most attractive summer resort region in New England. I have here a map which shows exactly where the island is located, so that you can judge for yourselves. It is in close proximity to Cape Cod and Marthas Vineyard.

Senator Works. Whereabouts is the leprosarium in San Francisco located?

Dr. Hoffman. It is at the Isolation Hospital, right near the outskirts of the city, at Army and De Haro Streets.

Now, if you can establish such an ideal colony as Massachusetts has in the heart of a summer resort region without detriment to the community and without risk of infection; and if you can establish such an excellent institution as San Francisco has reason to be proud of within the city limits, and without any practical difficulty, it is self-evident that when the question comes up as to where a Federal leprosarium should be located, it will not be so difficult to find a suitable location if the public is rationally and intelligently informed as regards the facts, derived from actual experience.

Senator Works. I suggested this morning that the Government might take over one or the other of the leprosariums that have already been established, which would, of course, create a great deal less friction than an effort to establish a new one.

The Chairman. Dr. Hoffman, do I understand that San Francisco has a sanitarium for leprosy, or is it merely one department of its big city hospital?

Dr. Hoffman. The best way I can describe the situation is that an adjoining yard of sufficient area has been fenced off from the isola-

tion hospital. Access to the institution is through the isolation hospital; but, as said before, the physician of the one is also in charge of the other institution. The lepers live in two large houses especially built for the purpose, each one having a room to himself. There is no connection between the isolation hospital and the great modern city and county hospital of San Francisco, which, in fact, is quite a distance from the leper settlement. The lepers have all the freedom they are properly entitled to without being a menace to the community, and they are, in their way, I am glad to say, happy and contented.

In contrast, permit me to direct your attention to the Early case in this city, where a single leper is isolated under only fairly satisfactory conditions. Even a leper remains human and desires company. The best way is to bring these afflicted people together in a settlement where they can be properly treated and where they feel that they are not looked upon as outcasts or prisoners.

At Molokai there are some six hundred and odd lepers, who constitute a happy and contented community. They have about all that goes to make life worth living under the trying conditions of their unhappy existence; they have, as far as practicable, their own houses, and many of them have their own families with them. The community has all the advantages of village life, including churches of different denominations, a well-equipped store, a baseball ground, a moving-picture show, etc. I can say in the light of my own experience that I never felt nearer to the attainment of peace on earth than I did among the lepers at Molokai. My personal investigations at Molokai, at San Francisco, and in Louisiana have profoundly impressed upon me the duty of a persistent effort in behalf of these most unfortunate and absolutely helpless victims of a peculiarly loathsome and practically hopeless disease. No words of mine can give expression to my own sorrow for these people; but in the light of my personal knowledge I can not but feel intensely the additional sorrow and suffering needlessly forced upon the helpless individual who suddenly and by no fault of his own finds himself the victim of leprosy in a State where he may be the only one of his kind. I believe that the Nation owes it to itself and to the cause of a broader civilization that it shall leave nothing undone to provide adequately and humanely for these unfortunates who, under present conditions, are often inhumanly treated.

Most of the lepers in Hawaii go to Molokai of their own free will and accord. They go with the understanding that they will be humanely and effectively treated by skillful physicians and nursed, if necessary, by those qualified to do so. Leprosy is a peculiar disease, and there are not many physicians who know how to diagnose and treat it. A leper is, therefore, infinitely better off in a leprosarium, such as the institutions in existence in Louisiana or San Francisco or on Penikese Island, where the physicians in charge are thoroughly familiar with the disease and not apprehensive of the risk of infection. I desire to put on record, Mr. Chairman, my conviction that what is being done in these institutions for the most afflicted of human beings reflects the finest traits of the American people and their highest achievement in philanthropy and humanity. Not much more could be done for the lepers if twice the amount of money were spent; but more unquestionably could be done to provide

adequately for the needs of those in charge of these institutions. Lepers require a considerable amount of medical care and nursing. Certainly at Molokai and at the settlement in Louisiana the burden which falls upon those in charge is, indeed, a very heavy one. Many of the lepers are blind and otherwise helpless. The Mother Superior in charge of the nurses at Molokai has been at the settlement for more than 20 years. The sisters perform the most menial service in the most efficient and uncomplaining way. Not a single case of leprosy infection has occurred among them. The Catholic sisters at the settlement in Louisiana perform a similar Christian and humane service under equally trying conditions.

The same conclusion applies to the sisters in charge of the Lazaretto at Tracadie, New Brunswick. There is, however, no exceptional martyrdom about this service, and the seclusion and isolation is self-imposed. The history of Christian service, however, affords no finer illustration of heroic self-secrifice than the work rendered by the physicians in charge and the nursing sisters and other lay helpers ministering to the needs of the most afflicted under the trying conditions of settlement life.

The CHAIRMAN. I wanted to ask you, before you get entirely away from the subject of California, whether the State maintains the leprosarium there or the city of San Francisco?

Dr. HOFFMAN. The entire cost of the maintenance of the leper settlement at San Francisco, so far as I know, is paid for by the city of San Francisco, under the direction and supervision of the city board of health.

The CHAIRMAN. Does the settlement take lepers from all over the State?

Dr. HOFFMAN. No, Senator; only, so far as I know, those who are apprehended within the city limits of San Francisco.

The CHAIRMAN. Then there is no State leprosarium in California?

Dr. HOFFMAN. No, Senator; there are no State institutions of this kind in California. Outside of San Francisco, there is a small leper settlement in or near Los Angeles, which, however, I had no opportunity to visit. There are probably six or seven patients there, but I understand they are adequately and suitably provided for. There are also one or two cases, I believe, at or near San Diego.

For the convenience of your committee, Mr. Chairman, I have prepared a list of leper settlements throughout the world for the purpose of making clear my point of view that in practically all other civilized countries the care of lepers is a matter of Government concern and in precise conformity to the principle of the bill under consideration providing for the establishment of a Federal leprosarium.

The CHAIRMAN. If there is no objection, we will have this list made a part of the testimony.

(The list referred to was subsequently submitted, and is here printed in full, as follows:)

LIST OF LEPER SETTLEMENTS OR COLONIES THROUGHOUT THE WORLD (PROBABLY INCOMPLETE).

Antigua.—Leper Asylum on Rat Island, harbor of St. Johns.

Australian Commonwealth.—Leper Lazaret, Little Bay, New South Wales; Leper Lazaret, Peel Island, near Brisbane, Queensland; Leper Lazaret, Day-

man Island, Torres Straits, Queensland; Leper Lazaret, Mud Island, Northern Territory.

Bahama Islands.—Leper Infirmary, Nassau.

Barbados.—Leper Lazaretto (121 inmates).

Brazil.—Hospital dos Lazaros, Rio de Janeiro.

British Guiana.—Mahaica Leper Asylum (387 inmates).

British North Borneo.—Segregation camps for lepers, Kapuan Island; leper settlement at Berhala.

Canada.—Leper Lazaretto, Tracadie, New Brunswick (14 inmates); Leper Asylum, Vancouver, British Columbia.

Ceylon.—Leper Asylum near Colombo, Hendala (376 inmates); leper colony, island of Mantivu, Batticaloa.

China.—Leper Asylum, Canton (300 inmates); Leper Asylum, Hokchiang, south of Foochow (100 inmates); Leper Asylum, Foochow; Leper Asylum Kucheng, Fuh Kien Province; Leper Asylum, Lake Home, Hangchow; Leper Asylum, Siao Kan, Hankow; Leper Home, Tunkun, Quantung Province (140 inmates).

Corea.—Fusan Leper Asylum, Fusan.

Costa Rica.—Hospital de Leprosos, San Jose (63 inmates).

Cuba.—San Lazaro Hospital for Lepers, Habana.

Cyprus.—Leper farm, near Nicosia (97 inmates).

Danish West Indies.—Leper Hospital, St. Croix.

Dutch Guiana (Surinam).—Leper colony, Bethesda (Moravian mission); leper colony, Groot Chatillon (Government).

Egypt.—Hospital des Lepreux, Cairo.

Federated Malay States.—Leper Asylum, Pulau Bangkor Laut, Perak, for Malays and Javanese (62 inmates); Leper Asylum, Selangor (368 inmates).

Fiji Islands.—Leper Asylum, Suva.

Finland.—Leprasjukhus, Tavastehus län (Government institution, 25 inmates).

French West Indies.—Hospital des Lepreux, island of La Desirade.

Germany.—Lepra Heim, Memel, East Prussia (20 inmates).

Greece.—Leper Asylum of Samos.

Guam.—Leper colony.

Hawaii.—Kalihi Leper Hospital, Honolulu (30 inmates); the Molokai settlement (638 inmates).

Iceland.—Leper Asylum, Reykjavik (51 inmates).

India.—Ahmedabad, Kagrapeth Leper Asylum; Allahabad Leper Asylum, United Provinces; E. F. Allbless Leper Home at Trombay; Alleppey Leper Asylum, Native State of Travancore; Almora Leper Asylum, Province of Kumaon (100 inmates); Ambala Leper Asylum, Punjab (20 inmates); Ankai Leper Asylum, Lower Burma; Asansol "Christaram" Leper Asylum for Homeless Lepers, Bengal; Baba Lakhan Leper Asylum, Punjab; Baidyanath Leper Asylum, Bengal; Bankura Leper Asylum, Bengal; Bhagalpur Leper Asylum, North Bengal; Calcutta Leper Asylum, Bengal; Calicut Leper Asylum, Madras Presidency; Chamba Leper Asylum, Native State of Chamba, Punjab (Himalayas); Champa Leper Asylum, Central Provinces; Chandag Leper Asylum near Pithoragash, Almora District; Chandkuri, Central Province; "Christaram; Leper Asylum for Homeless Lepers, see Asansol; Claire (Chandkuri) Leper Asylum, Central Provinces; Dehra Leper Asylum, Punjab (Himalayas); Dhamtari Leper Asylum, Central Provinces; Dhar Leper Asylum, Central India; Dharmsala Leper Asylum, Punjab; Ellichpur Leper Asylum, Central Provinces; Govindpur Leper Asylum, Bengal; Grace Away Mayne Leper Asylum, see Meerut, United Provinces; Hurda Leper Asylum, Central Provinces; Holt Skinner Memorial Hospital, see Rurki, Punjab; Kagrapeth Leper Asylum, see Ahmedabad; Kodur Leper Asylum, Madras Presidency; Kothara Leper Asylum, Central Provinces; Lohardaga Leper Asylum, Bengal; Ludhiana Leper Asylum, Punjab; Mandalay Leper Asylum, Burma (140 inmates); Mangaolore Leper Asylum, Madras Presidency; Matunga Leper Asylum, near Bombay; Maulmain Leper Asylum, Lower Burma; Meerut, Grace Olway Mayne Leper Asylum, Miraj Leper Asylum, Bombay Presidency; Mourbhanj Leper Asylum, Orissa, Bengal; Moradabad Leper Asylum, United Provinces; Mungeli Leper Asylum, Central India; Muzaffarngar Leper Asylum, United Provinces; Muzaffarpur Leper Asylum, Bengal; Naim Leper Asylum, United Provinces; Nasik Leper Asylum Bombay Presidency; Neyoor Leper Asylum,

Native State of Travancore; Patpara Leper Asylum, Central India; "Philadelphia" Leper Asylum, see Sulur, Madras Presidency; Pithora Leper Asylum, Punjab; Poladpur Leper Asylum, Bombay Presidency; Poona Leper Asylum, Bombay Presidency; Pui Leper Asylum, Bombay Presidency; Purulia Leper Asylum, Bengal (700 inmates); Raipur Leper Asylum, Central Provinces; Ramachandrapuram Leper Asylum, Madras Presidency; Raniganj Leper Asylum, Bengal; Rawal Pindi Leper Asylum, Punjab; Rivaz Wards Leper Asylum, see Tarn Taran, Punjab; Rurki, Holt Skinner Memorial Hospital, Punjab; Sabathu Leper Asylum, near Simla, Punjab; Saharanpur Leper Asylum, Punjab; Salur (Vizagapatam) Leper Asylum, Madras Presidency; Salur "Philadelphia" Leper Asylum, Madras Presidency; Sehore Leper Asylum (Bhopal), Central India; Sholapur Leper Asylum, Hyderabad; Sialkot Leper Asylum, Punjab; Sylhet Leper Asylum, Bengal; Tarn Taran Leper Asylum Rivas Wards, Punjab; Trivandrum Leper Asylum, Native State of Travancore; Trombay, see E. F. Allbless Leper Home, Salsette Island, Bombay Presidency; Udaipur Leper Asylum, Rajputana; Ujjain Leper Asylum, Central India; Wardha Leper Asylum, Central Provinces.

NOTE.—According to the census of 1911, there were then 73 leper asylums in India, with 5,116 inmates.

Jamaica.—Lepers' Home, Kingston (117 inmates).

Japan.—Aomori Leper Asylum (Government); Kagawa Leper Asylum (Government); Kioto Leper Asylum; Kumamoto Leper Asylum (Government); Kumamoto Christian Leper Asylum; Osaka Leper Asylum (Government); Tokyo Leper Asylum (Government); Tokyo Christian Leper Asylum; "I-hai-en" Leper Asylum, Meguro near Tokyo.

Madagascar.—Leper Lazar-house at Ilafy, Antananarivo; Leper Colony, Abohivaraka.

Mauritius.—St. Lazare Leper Asylum (95 inmates).

New Caledonia.—Leper Asylum, Pic des Morts, Bay of Canala; Leper Asylum, Isle of Goats, Nouméa.

Norway.—St. Jörgens Hospital, Bergen (20 inmates); Pleiestiftelsen No. 1, Bergen (74 inmates); Reitjerdets Pleiestiftelse, Strinden ved Trondhjem (83 inmates).

Panama Canal Zone.—Palo Seco Leper Asylum (58 inmates).

Philippines.—Culion Leper Settlement (3,602 inmates); San Lazaro Leper Hospital, Manila (205 inmates).

Porto Rico.—Leper colony on the Isle de Cabras, at the entrance of San Juan Harbor; leper colony on Goat Island.

Portugal.—Hospital de San Lazaro, Lisbon (74 inmates); Leper Lazaretto, Funchal, Madeira.

Russia.—Hospital for Lepers, Riga.

NOTE.—There are 21 leper institutions in Russia, of which 17 are supported by voluntary contributions. During the year 1911, 1,621 leprous patients were treated by physicians. (Russian Yearbook, 1915.)

St. Kitts, British West Indies.—St. Kitts Leper Asylum (69 inmates).

St. Vincent.—St. Vincent Leper Asylum (9 inmates).

Siberia.—Leper Colony, Villuisk, Eastern Siberia.

Sierra Leone.—Male Leprosy Segregation Ward, Kissy.

South Africa.—Almora Leper Asylum, Robben Island, off Capetown (612 inmates); Leper Hospital, Emjanyana, Cape Colony (645 inmates); Leper Hospital, Amatikulu, Natal (175 inmates); Leper Hospital, Pretoria, Transvaal (792 inmates); Leper Hospital, Johannesburg.

Southern Nigeria.—Leper asylums at Lagos, Ibusa, and Onitsha.

Spain.—Colonia Sanitaria de San Francisco de Borja, Fontilles (Laguar), Provincia de Alicante; Hospital de San Lazaro, Santiago.

Straits Settlements.—Leper Asylum, Pulau Jerejak (403 inmates); Leper Asylum, Singapore (52 inmates); Female Leper Asylum, Jelutong (21 inmates).

Sumatra.—Leper Asylum Huta Salem (100 inmates); Lagubot Leper Asylum.

Sweden.—Järfso sjukhus for spetälske, Järfsö (33 inmates).

Togoland.—Aussaetzigenheim Bogida (19 inmates).

Trinidad.—Leper Asylum Cocorite (318 inmates).

Turkey.—Moravian Leper Asylum, Jerusalem; Leper Lazaretto, Damascus, Syria.

United States.—Isolation Hospital, San Francisco, Cal. (15 inmates); County Hospital, leper ward, Los Angeles, Cal. (6 inmates); Leper Home of the State

of Louisiana, Carville, La. (104 inmates); leper colony, island of Penikese, Buzzards Bay, Mass. (11 inmates).

United States of Colombia.—Leper Lazaretto, Agua de Dios (520 inmates); Leper Lazaretto, Contracion, Province of Santander.

Venezuela.—Leper Lazaretto, Maracaibo, Zulia (477 inmates); Leper Lazaretto, Caracas (125 inmates); Leper Lazaretto, Estado de Sucre (9 inmates).

Zanzibar.—Walezo Leper Asylum (95 inmates).

Dr. HOFFMAN. The foregoing list emphasizes the almost universal practice regarding leper segregation in the civilized countries of the world. In many of the far eastern countries the settlements are not government institutions, but are administered by Christian missions, or otherwise, and maintained by philanthropy and charity. I can not sufficiently emphasize my conviction, based upon a careful consideration of all the available evidence, that segregation alone provides an effective means of controlling the disease.

The CHAIRMAN. Segregation, you say, is the only means?

Dr. HOFFMAN. I am absolutely of this opinion, which is, I believe, shared by all the leading authorities on the subject throughout the world.

The CHAIRMAN. Do you regard the public as being seriously endangered by the methods at present pursued in this country?

Dr. HOFFMAN. I am unconditionally of that opinion, Senator; and I will go further and say that such cases as those which have recently occurred in New York and New Jersey show a reckless and almost criminal disregard of known safety precautions. I say this with reluctance, but really there seems no other word for this fatuous policy of indifference than "criminal," in, of course, a qualified sense of the term. If you have ever seen a single leper in the terminal state of the disease—and I have seen many of them—you will realize how needlessly the public is menaced by permitting 30 and 80 lepers to be at large in New York and Chicago, respectively, as is claimed to be the case——

The CHAIRMAN (interposing). You mean 80 lepers in Chicago?

Dr. HOFFMAN. Yes; 80, and, as said at the outset of my evidence, I had this statement confirmed by the board of health; but, as stated, the number actually known to the board is only three or four, the remaining number of cases being known to experts or specialists in skin diseases who are, as a rule, first consulted by lepers in the initial stages of the disease.

The CHAIRMAN. And is there no segregation whatever?

Dr. HOFFMAN. There is no effective segregation other than that the few apprehended cases are probably isolated in some poorhouse or isolation hospital, under conditions which must be more or less of a menace to the community.

The CHAIRMAN. You think, then, Doctor, it is a very serious menace to the health of the people of the United States to allow the present methods to go on?

Dr. HOFFMAN. I can, perhaps, best explain my point of view by stating that my professional duties as statistician of the Prudential require me to cooperate with public-health authorities and health-promoting agencies in every reasonable manner as regards methods and means of preventing disease and prolonging human life; and that if I did not feel that leprosy was of sufficient present or future importance to life insurance interests I would probably not have

gone as extensively into this matter as I have. It is, of course, only one of many phases of our public-welfare work, but having had these exceptional opportunities for observation and inquiry, I conceive it to be my duty to present the facts of a lamentable situation to the public for consideration. Aside, however, from the professional point of view, I feel strongly, on the one hand, the seriousness of the present situation as regards the general public, and as best illustrated by the two cases of the last few days just brought to your attention; and, on the other, the urgency of more humane methods of treatment and care as regards the lepers themselves.

The CHAIRMAN. That, in other words, is your official point of view as statistician of the Prudential Insurance Co. and your private view as regards the Christian and humanitarian duty on the part of the general public?

Dr. HOFFMAN. Yes, Senator.

The CHAIRMAN. How would you describe, Doctor, the danger to the public? Do you mean to say that the disease is on the increase and that as the lepers at large travel about they infect others?

Dr. HOFFMAN. Unquestionably; for how could it be otherwise? Every case that we know of, Senator, at least every case that has been sufficiently investigated, indicates some previous connection with a center or focus of infection. The leper girl referred to in this morning's *Sun* came from Key West, which, notoriously, has been more or less infected with leprosy at different times from Cuba or other parts of the West Indies, where the disease is quite common. I have among my records another case of a man afflicted with leprosy in the city of New York whose infection was traced to Key West. The Bahama Islands are also a source of infection. Most of the lepers, for some unknown reason, are poor people, and they often live for months, and even for years, in back-room tenements, with the practical certainty of infection to others. No one knows exactly how the disease is spread from person to person, but practically every case can be traced back to some center or focus of infection.

The CHAIRMAN. Is the disease exclusively among poor people, or does it exist also among people of means?

Dr. HOFFMAN. Leprosy is almost entirely confined to the poor, but there are some very curious and marked exceptions. In Honolulu during my visit to the islands last year a well-known and highly esteemed school-teacher—a white woman—was found to be a leper, and she is now at Molokai. When finally diagnosed as a leper she was in a fairly advanced stage of the disease, and Dr. McCoy, who was a member of the board who examined her, is present in this room. How she contracted the disease, or whether she contaminated others, is unknown. There are some such cases every year. While the disease is diminishing in most countries, it is apparently decreasing only where it is under control by unconditional segregation.

Senator WORKS. I asked a question a while ago as to the number of new patients that are taken in at Molokai. Can you inform me about that?

Dr. HOFFMAN. Yes, Senator; I have with me the statistics for Molokai for a period of years, and I submit the following table for inclusion in the record.

The CHAIRMAN. If no objection is made, the table will be printed.

(The table referred to is here printed in full, as follows:)

Statistics of the leper settlement at Molokai, 1870–1915.

Year.	Lepers admitted to Molokai.	Admission rate per 10,000 of population of Hawaii.	Year.	Lepers admitted to Molokai.	Admission rate per 10,000 of population of Hawaii.
1870–1879	1,495	23.8	1912	91	4.4
1880–1889	1,968	24.3	1913	113	5.2
1890–1899	1,276	11.7	1914	67	2.9
1900–1910	805	4.5	1915	49	2.1
1911	40	2.0			

Dr. HOFFMAN. You will note, Senator, that according to this table the leper admission rate has diminished from 23.8 per 10,000 of population to 2.1 per 10,000 during 1915. During the earlier years, however, the apprehensions were less complete, so that the actual diminution in the frequency of leprosy has been even greater than shown by the table. The number of new admissions during 1915 was only 49.

Senator WORKS. Have you also the death rate for the number of deaths per annum?

Dr. HOFFMAN. Yes, Senator; I have with me a table showing in the same manner the number of lepers who died at Molokai.

The CHAIRMAN. If no objection is made, the table will be printed.

(The table referred to is here printed in full, as follows:)

Deaths of lepers at Molokai, Hawaii, 1870–1915.

Years.	Population.	Deaths.	Rate per 10,000.	Years.	Population.	Deaths.	Rate per 10,000.
1870–1879	627,258	1,157	18.4	1912	209,132	64	3.1
1880–1889	809,576	1,447	17.9	1913	217,744	49	2.3
1890–1899	1,091,059	1,443	13.2	1914	227,391	75	3.3
1900–1909	1,714,294	1,070	6.2	1915	231,210	62	2.7
1911	200,520	61	3.0				

Dr. HOFFMAN. You will note, Senator, that according to this table 62 lepers died during the year 1915.

Senator WORKS. My question is as regards the island of Molokai.

Dr. HOFFMAN. The deaths from leprosy at Molokai probably constitute the entire mortality; but I have not with me at this moment a separation of the deaths from leprosy at Molokai from all the deaths from leprosy in the Territory of Hawaii.

Senator WORKS. Then it would appear that in some years there are more new patients taken in at Molokai than there are deaths during the year.

Dr. HOFFMAN. Yes, Senator; at least it would seem to be so.

Senator WORKS. Practically, I assume, there are none discharged as cured.

Dr. HOFFMAN. Some are discharged, not as cured, but in a sufficiently arrested stage of the disease to be harmless as regards the community at large. As far as my information enables me to answer this question, there have been 118 persons discharged from Molokai, not as cured, but as well and free from clinical evidence of leprosy after prolonged treatment. The final judgment in this matter rests with a board of qualified experts appointed for the purpose. Simi-

lar results have been reported for the leper settlement at Louisiana by Dr. Hopkins and Dr. Dyer. My statement as regards Molokai is on the authority of the physician in charge, Dr. William J. Goodhue. I am also informed as regards successful cases of treatment at many other leper settlements where the patients were taken care of under proper conditions. No one questions, in the light of a world-wide experience, that through segregation alone can leprosy be brought under public control with the practical certainty of ultimate, though very gradual, eradication.

Senator WORKS. Does your data show the proportionate number of deaths that have occurred during the period since segregation has been practiced in Hawaii?

Dr. HOFFMAN. I have not all the data with me for the purpose, but I have before me a table showing the mortality from leprosy in the Territory from 1902 to 1914.

The CHAIRMAN. Do you include both of those years?

Dr. HOFFMAN. Yes; both years are inclusive—1902 to 1914.

Senator WORKS. What would be the leprosy mortality rate of Hawaii per annum?

Dr. HOFFMAN. The rate per annum during the period under observation has varied between a maximum of 5 per 10,000 during 1902 and a minimum of 2.2 per 10,000 during 1908; during 1914 the rate was 2.6. In other words, in proportion to the total mortality, the leprosy mortality is comparatively small. Out of 3,707 deaths from all causes during 1914, the number of deaths from leprosy in the Territory of Hawaii was 59, or 1.6 per cent.

The CHAIRMAN. Does it appear from these statistics as though we could reasonably expect leprosy to be completely eradicated from the islands in the future?

Dr. HOFFMAN. Unquestionably.

The CHAIRMAN. In the near future?

Dr. HOFFMAN. No; that would be quite impossible. In fact, Senator, your question brings me precisely to the main point of this discussion, for if leprosy once gains a foothold it is extremely hard to eradicate the disease, which may continue to prevail, though to a very limited extent, for many years.

At Tracadie, New Brunswick, for illustration, the Government leprosarium was established in, I think, 1846. The number of cases under treatment has probably never exceeded 30. Between 1815 and 1915 only 193 deaths from leprosy appear to have been recorded in the Province. By 1891 the number of lepers under treatment was 22. It has fluctuated slightly, about 16 since that time, but according to the last official report for year ending January 1, 1916, the number under treatment was only 14, which, as far as I know, is the smallest number on record. There can be no question of doubt that if there had been no segregation the disease would have spread widely over the Maritime Provinces and into New England; under effective segregation leprosy has been under control, and, as shown by the statistics, the number of lepers has now been reduced to 14.

I may call your attention in this connection to the fact that the lazaretto at Tracadie, New Brunswick, is owned and controlled by the Canadian Government, which has another leprosarium on the Pacific coast, near Vancouver. Considering the introduction of foreign lepers into the Dominion chiefly orientals, but also a few Icelanders,

it is self-evident that segregation has been actually more effective than would appear from the statistics just quoted. There has, however, for at least 100 years been a local foci of the disease in New Brunswick and a small adjoining portion of the Province of Quebec. On March 31, 1914, according to an official return, there were then 19 lepers, of whom 15 were native of the Province of New Brunswick, and of the 4 others 1 was Canadian born, 1 was from Barbados, 1 from Iceland, and 1 from Russia. The Russian woman was discovered in Winnipeg during the preceding year in an advanced stage of the disease.

One of the preceding witnesses referred to the new admissions to the leprosarium at Culion, in the Philippines. His statement seemed to imply that no new cases of leprosy were discovered in the islands, when, as a matter of fact, there are many new admissions every year.

Senator WORKS. Will you give us the figures about that?

Dr. HOFFMAN. Yes, Senator; the number of lepers admitted to the Culion leper colony during 1914 was 859; the number of lepers at the colony at the end of that year was 3,602. I can give you the record for the past 10 years if you care to include the statistics in the record.

Senator WORKS. I think it would be well to include all of your statistics in the record.

The CHAIRMAN. If you have a table there, Doctor, you might put it in.

Dr. HOFFMAN. I have here an entire set of tables, Senator, which I am sure would make a valuable addition to the record. They have all been derived from official sources and can be relied upon as trustworthy. They constitute what is probably the most complete statistical account of leprosy throughout the world.

The CHAIRMAN. I think they should all go into the record, and we shall be pleased to put them in.

(The tables referred to are here printed in full, as follows:)

List of tables—leprosy statistics.

No.	Locality.	Period.	Title.
1	United States registration area	1900–1914	Mortality.
2	Louisiana	1896–1915	Admissions to leper home.
3	....do	1912–1914	Type of disease, by age.
4	....do	1914	Inmates, by race.
5	Hawaii	1902–1915	Mortality.
6	....do	1911–1914	Mortality, by race.
7	....do	1866–1915	Statistics of Molokai.
8	Philippine Islands	1903–1914	Known lepers.
9	....do	1906–1914	Admissions to Culion.
10	....do	1906–1914	Mortality at Culion.
11	Panama Canal Zone	1907–1914	Statistics of Palo Seco Leper Asylum.
12	New Brunswick	1890–1916	Statistics of Tracadie.
13	Cuba	1903–1913	Mortality.
14	St. Kitts, Nevis, and Anguilla	1901–1914	Do.
15	Antigua and Barbuda	1901–1911	Do.
16	Trinidad and Tobago	1901–1913	Do.
17	....do	1909–1915	Statistics of Cocorite Leper Asylum.
18	....do	1909–1915	Admissions to Cocorite, by nativity.
19	British Guiana	1913	Inmates of Mahaica Leper Asylum, by race.
20	....do	1902–1913	Deaths, by duration of disease.
21	....do	1902–1913	Deaths, by age and sex.
22	....do	1902–1913	Deaths, by cause.
23	Venezuela	1905–1912	Mortality and number of lepers.
24	Brazil, Rio de Janeiro	1891–1912	Mortality.

List of tables—leprosy statistics—Continued.

No.	Locality.	Period.	Title.
25	Brazil, Rio de Janeiro	1910–1912	Mortality, by age and sex.
26	Brazil, Pernambuco	1907–1912	Mortality.
27	Brazil, Sao Paulo	1904–1912	Do.
28	Iceland	1901	Lepers, by age and sex.
29	.....do	1910	Do.
30	Norway	1856–1910	Number of lepers.
31	.....do	1910	Lepers, by domicile.
32	.....do	1901–1910	Average age and duration of disease.
33	.....do	1910	Lepers, by age and sex.
34	.....do	1910	Mortality, by age and sex.
35	.....do	1856–1913	Inmates in leper asylums.
36	Sweden	1907–1913	Number of lepers.
37	.....do	1912	Lepers, by domicile.
38	Finland	1910	Number of lepers.
39	Prussia	1911	Do.
40	Spain	1904	Lepers, by Provinces.
41	Italy	1896–1912	Mortality.
42	Bosnia and Herzegovina	1906–1912	Mortality and number of lepers.
43	Cyprus	1906–1914	Statistics of leper farm.
44	Egypt	1907	Lepers, by sex.
45	.....do	1907	Lepers, by Provinces.
46	Sierra Leone	1908–1913	Cases treated in hospitals.
47	Gold Coast Colony	1910–1913	Do.
48	Zanzibar	1909	Number of lepers.
49	Union of South Africa	1912	Inmates in asylums.
50	Mauritius	1890–1914	Mortality.
51	India	1881–1911	Lepers, by Provinces.
51a	Ceylon	1910–1914	Mortality, by race.
52	Straits Settlements	1914	Inmates of Pulau Jerejak Leper Asylum, by race.
53	.....do	1914	Inmates of Pulau Jerejak Leper Asylum, by occupation.
54	Federated Malay States	1909–1914	Lepers treated in hospitals.
55	Japan	1907–1911	Mortality, by sex.
56	Commonwealth of Australia	1907–1911	New cases of leprosy.

TABLE No. 1.—*Mortality from leprosy in the United States registration area, 1900–1914.*

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1900	30,794,273	4	0.1	1908	46,789,913	11	0.2
1901	31,370,952	6	.2	1909	50,870,518	9	.2
1902	32,029,815	5	.2	1910	53,843,896	10	.2
1903	32,701,083	4	.1	1911	59,275,977	7	.1
1904	33,349,137	4	.1	1912	60,427,133	11	.2
1905	34,094,605	8	.2	1913	63,299,164	6	.1
1906	41,983,419	3	.1	1914	65,989,295	12	.2
1907	43,016,990	7	.2				

TABLE No. 2.—*Statistics of the leper home of Louisiana, 1896–1916.*

[Source: Tenth biennial report of the board of control for the leper home of the State of Louisiana, 1914.]

Year.	New cases admitted.	Number of inmates.[1]	Year.	New cases admitted.	Number of inmates.
1896	3	.....	1907	8	.....
1897	6	.....	1908	8	47
1898	4	23	1909	18	.....
1899	7	.....	1910	17	66
1900	3	30	1911	15	.....
1901	10	.....	1912	12	74
1902	10	38	1913	25	.....
1903	11	.....	1914	22	87
1904	14	38	1915	21	102
1905	9	.....	1916	.....	104
1906	11	47			

[1] Census of inmates is recorded only biennially.

TABLE No. 3.—*Cases of leprosy under treatment in the leper home of Louisiana according to type of disease, 1912–1914.*

Age.	Total.		Anesthetic.		Tubercular.		Mixed.		Type not stated, white.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	
Under 15	12	2	1	.....	8	.....	3	2	.....
15–24	23	2	4	.....	8	1	11	1	.....
25–34	16	1	7	.....	1	1	8	.....	.....
35–44	12	8	4	1	4	6	4	1	.....
45–54	15	6	2	1	5	2	8	3	.....
55–64	6	2	1	1	4	.....	1	1	.....
65 and over	4	3	.....	1	1	2	3	.....	.....
Not stated	7	.....	1	.....	2	.....	3	.....	1
Total	95	24	20	4	33	12	41	8	1

TABLE No. 4.—*Number of inmates of the leper home of the State of Louisiana, Apr. 16, 1914, by race.*

	Population of Louisiana.	Lepers.	Rate per 1,000,000.
White	1,025,674	72	70.2
Colored	739,102	15	20.3
Total	1,764,776	87	49.3

TABLE No. 5.—*Mortality from leprosy in Hawaii, 1902–1915.*

[Source: Annual reports of the registrar general of the Territory of Hawaii.]

Year ending June 30.	Population.	Deaths from leprosy.	Rates per 1,000,000.	Year ending June 30.	Population.	Deaths from leprosy.	Rates per 1,000,000.
1902	160,078	80	499.8	1911	200,520	47	234.4
1903	163,917	46	280.6	1912	209,132	50	239.1
1904	167,756	56	333.8	1913	217,744	48	220.4
1905	171,595	64	373.0	1914	227,391	59	259.5
1902–1905	663,346	246	370.8	1911–1914	854,767	204	238.7
1906	175,434	58	330.6	1915	229,300	39	170.1
1907	179,273	56	312.4				
1908	183,112	41	223.9				
1909	186,951	45	240.7				
1910	190,790	68	356.4				
1906–1910	915,560	268	292.7				

TABLE No. 6.—*Mortality from leprosy by race in Hawaii, July 1, 1911–June 30, 1914.*

[Source: Annual reports of the registrar general of the Territory of Hawaii.]

Race.	Aggregate population.	Deaths from leprosy.	Rate per 1,000,000.	Race.	Aggregate population.	Deaths from leprosy.	Rate per 1,000,000.
Hawaiian	86,173	131	1,520.2	Japanese	263,665	3	11.4
Part Hawaiian	41,404	4	96.6	All others	98,303	2	20.3
Portuguese	73,791	6	81.3				
Chinese	71,695	11	153.4	Total	635,031	157	247.2

TABLE No. 7.—*Statistics of the leper settlement at Molokai, Hawaii, 1866–1915.*

Years.	Population of Hawaii.	Admissions to Molokai.	Deaths of all lepers.	Rate per 1,000,000.	Number of lepers in Molokai Dec. 31.	Lepers per 1,000,000.
1866	62,959	141	36	571.8	115	1,826.6
1867	61,949	91	24	387.4	170	2,744.2
1868	60,939	131	27	443.1	267	4,381.4
1869	59,929	190	59	984.5	312	6,541.1
1866–1869	245,776	552	146	594.0	944	3,840.9
1870	58,919	57	57	967.4	392	6,653.2
1871	57,909	178	52	898.0	518	8,945.1
1872	56,897	91	63	1,107.3	546	9,596.3
1873	58,870	415	142	2,412.1	810	13,759.1
1874	60,843	78	141	2,317.4	731	12,014.5
1870–1874	293,438	819	455	1,550.6	2,997	10,213.4
1875	62,816	178	149	2,372.0	754	12,003.3
1876	64,790	75	119	1,836.7	704	10,865.9
1877	66,764	122	129	1,932.2	694	10,394.8
1878	68,738	209	111	1,614.8	792	11,522.0
1879	70,712	92	194	2,743.5	688	9,729.6
1875–1879	333,820	676	702	2,102.9	3,632	10,880.1
1880	72,685	51	151	2,077.5	589	8,103.5
1881	74,658	195	129	1,727.9	654	8,759.9
1882	76,631	70	111	1,448.5	613	7,999.4
1883	78,604	300	150	1,908.3	763	9,706.9
1884	80,578	108	167	2,072.5	702	8,712.1
1880–1884	383,156	724	708	1,847.8	3,321	8,667.5
1885	82,146	103	142	1,728.6	663	8,071.0
1886	83,715	43	101	1,206.5	600	7,167.2
1887	85,284	220	111	1,301.5	708	8,301.7
1888	86,853	571	236	2,717.2	1,033	11,893.7
1889	88,422	307	149	1,685.1	1,187	13,424.3
1885–1889	426,420	1,244	739	1,733.0	4,191	9,828.3
1890	89,990	185	158	1,755.8	1,213	13,479.3
1891	93,161	141	210	2,254.2	1,142	12,258.4
1892	96,333	105	152	1,577.9	1,095	11,366.8
1893	99,504	209	151	1,517.5	1,153	11,587.5
1894	102,675	129	159	1,548.6	1,123	10,937.4
1890–1894	481,663	769	830	1,723.2	5,726	11,888.0
1895	105,846	105	141	1,332.1	1,087	10,269.6
1896	109,020	142	114	1,045.7	1,115	10,227.5
1897	120,265	124	140	1,164.1	1,099	9,138.2
1898	131,510	75	114	865.9	1,059	8,052.6
1899	142,755	61	104	728.5	1,014	7,103.1
1895–1899	609,396	507	613	1,005.9	5,374	8,818.6
1900	154,001	109	134	870.1	983	6,383.1
1901	157,792	94	172	1,090.0	900	5,703.7
1902	161,583	80	106	656.0	874	5,409.0
1903	165,374	114	101	610.7	872	5,272.9
1904	169,165	92	107	632.5	856	5,060.1
1900–1904	807,915	489	620	767.4	4,485	5,551.3
1905	172,956	95	95	549.3	854	4,937.7
1906	176,747	64	84	475.3	834	4,718.6
1907	180,538	78	88	487.4	809	4,481.1
1908	184,329	32	59	320.1	771	4,182.7
1909[1]	191,809	47	[1] 124	430.8	614	3,199.4
1905–1909	906,479	316	450	448.9	3,882	4,282.5
1911[2]	200,520	40	61	304.2	592	2,952.3
1912[2]	209,132	91	64	306.0	622	2,974.2
1913[2]	217,744	113	49	225.0	686	3,150.5
1914[2]	227,391	67	75	329.8	666	2,928.9
1915[2]	231,210	49	62	268.2	638	2,759.4
1911–1915	1,085,997	360	311	286.4	3,204	2,950.3

[1] 18 months, Jan. 1, 1909–June 30, 1910.

[2] Years ending June 30.

NOTE.—Settlement established Jan. 6, 1866.

TABLE No. 8.—*Number of known lepers in the Philippine Islands, 1903–1914.*

[Source: Annual Reports of the Bureau of Health for the Philippine Islands.]

Year.	Population.	Known lepers in the islands.	Rate per 1,000,000.	Year.	Population.	Known lepers in the islands.	Rate per 1,000,000.
1903	6,987,686	3,323	475.6	1909	7,446,920	2,273	305.2
1904	7,094,225	3,632	514.1	1910	7,523,459	2,272	302.0
1905	7,140,764	3,580	501.3	1911	7,600,000	2,506	329.7
1906	7,217,303	3,494	484.1	1912	7,676,537	2,912	379.3
1907	7,293,842	2,826	387.5	1913	7,753,076	3,442	444.0
1908	7,370,381	2,488	337.6	1914	7,830,000	3,807	486.2

TABLE No. 9.—*Admissions to the leper colony at Culion, Philippine Islands, 1906–1914.*

[Source: Report of the Bureau of Health for the Philippine Islands, 1914.]

Year.	Population of Philippine Islands.	Admissions of lepers.	Rate per 1,000,000.	Year.	Population of Philippine Islands.	Admissions of lepers.	Rate per 1,000,000.
1906	7,217,303	802	111.1	1911	7,600,000	889	117.0
1907	7,293,842	690	94.6	1912	7,676,537	965	125.7
1908	7,370,381	1,603	217.5	1913	7,753,076	795	102.5
1909	7,446,920	1,378	185.0	1914	7,830,000	887	113.3
1910	7,523,459	930	123.6				

TABLE No. 10.—*Mortality of lepers in the Culion Leper Colony, P. I., 1907–1914.*

[Source: Annual Reports of the Bureau of Health for the Philippine Islands.]

Fiscal year ending June 30—	Population.	Deaths.	Rate per 1,000,000.	Fiscal year ending June 30—	Population.	Deaths.	Rate per 1,000,000.
1907 [1]	5,441,679	205	37.7	1912	7,638,268	531	69.5
1908	7,332,111	958	130.7	1913	7,714,806	385	49.9
1909	7,408,650	862	116.4	July 1–Dec. 31, 1913	3,876,538	290	74.8
1910	7,485,189	838	112.0	Calendar year 1914	7,830,000	513	65.5
1911	7,561,729	427	56.5				

[1] 9 months only.

TABLE No. 11.—*Statistics of Palo Seco Leper Asylum, Panama Canal Zone, 1907–1915.*

[Source: Annual Reports of the Department of Sanitation of the Isthmian Canal Commission.]

Year.	Population of Canal Zone.	Deaths in asylum.	Rate per 1,000,000.	Inmates, Dec. 31.	Rate per 1,000,000.
1907	102,133	.....	.....	14	137.1
1908	120,097	0	.....	22	183.2
1909	135,180	1	7.4	34	251.5
1910	151,591	3	19.8	36	237.5
1911	156,936	2	12.7	49	312.2
1912	146,510	7	47.8	48	327.6
1913	129,104	9	69.7	45	348.6
1914	123,592	6	48.5	50	404.6
1915	121,650	2	16.4	58	476.8

NOTE.—Of the 62 lepers treated during the year ended June 30, 1915, 5 were white and 57 colored.

TABLE No. 12.—*Statistics of the leper lazarette at Tracadie, New Brunswick, 1890–1916.*

Year.	Number of patients Jan. 1.			Admitted during the year.			Total.	Desertions or discharged, disease arrested.			Deaths.		
	Men.	Women.	Total.	Men.	Women.	Total.		Men.	Women.	Total.	Men.	Women.	Total.
1890	9	11	20	2	2	4	24	[1] 1	.....	1	2	3	5
1891	8	10	18	4	2	6	24	.....	.....	.....	1	1	2
1892	11	11	22	3	.....	3	25	.....	.....	.....	.....	3	3
1893	14	8	22	1	3	4	26	.....	.....	.....	4	2	6
1894	11	9	20	1	.....	1	21	.....	.....	.....	.....	1	1
1895	12	8	20	1	.....	1	21	.....	.....	.....	.....	2	2
1896	13	6	19	4	.....	4	23	.....	.....	.....	3	.....	3
1897	14	6	20	8	4	12	32	.....	.....	.....	4	4	8
1898	18	6	24	.....	.....	.....	24	[2] 1	.....	1	2	.....	2
1899	15	6	21	2	3	5	26	.....	.....	.....	2	1	3
1900	15	8	23	1	.....	1	24	.....	.....	.....	3	1	4
1901	14	7	21	1	1	2	23	[3] 2	.....	2	3	1	4
1902	9	7	16	1	.....	1	17	.....	.....	.....	.....	.....	.....
1903	10	7	17	1	2	3	20	.....	.....	.....	3	1	4
1904	8	8	16	2	1	3	19	.....	.....	.....	1	3	4
1905	9	6	15	.....	1	1	16	[4] 1	.....	1	.....	.....	.....
1906	8	7	15	.....	1	1	16	.....	.....	.....	.....	1	1
1907	8	7	15	1	1	2	17	[5] 1	1	.....	.....	.....	.....
1908	9	7	16	2	1	3	19	.....	.....	.....	.....	1	1
1909	10	8	18	1	1	2	20	.....	.....	.....	1	.....	1
1910	10	9	19	4	.....	4	23	.....	.....	.....	1	1	2
1911	14	9	23	1	.....	1	24	[6] 1	.....	1	2	1	3
1912	13	8	21	.....	2	2	23	[6] 1	.....	1	.....	.....	.....
1913	13	8	21	.....	.....	.....	21	.....	.....	.....	2	.....	2
1914	9	10	19	1	2	3	22	.....	.....	.....	3	3	6
1915	7	9	16	.....	.....	.....	16	.....	.....	.....	1	1	2
1916	6	8	14	.....	.....	.....	14	.....	.....	.....	1	1	2

[1] Disease arrested.
[2] Went to Bermuda, his native land.
[3] Deserters.
[4] Deserter; came back in 1909.
[5] Sent out by Dr. Smith; came back in 1912.
[6] Disease arrested; discharged by Dr. Langis.

TABLE No. 13.—*Mortality from leprosy in Cuba, 1903–1913.*

[Source: Sanidad y Beneficencia, Boletin Oficial de la Secretaria, Habana.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1903	1,810,889	31	17.1	1909	2,116,402	25	11.8
1904	1,870,412	17	9.1	1910	2,150,112	35	16.3
1905	1,929,935	29	15.0	1911	2,183,823	52	24.3
1906	1,989,458	39	19.6	1912	2,217,534	37	16.7
1907	2,048,980	47	22.9				
				1908–1912	10 750,562	180	16.7
1903–1907	9,649,674	163	16.9				
				1913	2,251,245	43	19.1
1908	2,082,691	30	14.4				

TABLE No. 14.—*Mortality from leprosy in St. Kitts, Nevis, and Anguilla, 1901–1914.*

[Source: Medical reports on the sanitary condition of the Presidency of St. Kitts-Nevis and the Island of Anguilla, Leeward Islands Colony.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1901	46,776	9	192.4	1909	44,674	16	358.2
1902	46,580	2	42.9	1910	44,508	11	247.1
1903	46,346	12	258.9				
1904	46,086	7	151.9	1906–1910	225,271	50	222.0
1905	45,865	15	327.0				
				1911	43,303	6	138.6
1901–1905	231,653	45	194.3	1912	43,711	10	228.8
				1913	44,279	4	90.3
1906	45,655	5	109.5	1914	44,847	6	133.8
1907	45,335	11	242.6				
1908	45,099	7	155.2	1911–1914	176,140	26	147.6

TABLE No. 15.—*Mortality from leprosy in Antigua and Barbuda, 1901–1911.*

[Source: Annual reports of the registrar general on the vital statistics, Antigua.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1901	35,073	7	199.6	1907	33,390	4	119.8
1902	34,792	3	86.2	1908	33,110	7	211.4
1903	34,511	10	289.8	1909	32,830	4	121.8
1904	34,230	5	146.1	1910	32,550	3	92.2
1905	33,950	9	265.1	1906–1910	165,550	20	120.8
1901–1905	172,556	34	197.0	1911	32,269	4	124.0
1906	33,670	2	59.4				

TABLE No. 16.—*Mortality from leprosy in Trinidad and Tobago, 1901–1913.*

[Source: Annual reports of the registrar general on the vital statistics, Trinidad.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1901	275,261	59	214.3	1908	317,513	49	154.3
1902	282,125	43	152.4	1909	323,823	52	160.6
1903	287,737	38	132.1	1910	330,270	45	136.3
1904	233,460	41	139.7	1906–1910	1,588,181	261	164.3
1905	299,296	66	220.5	1911	336,839	41	121.7
1901–1905	1,437,879	247	171.8	1912	343,408	42	122.3
1906	305,249	49	160.5	1913	348,958	41	117.5
1907	311,321	66	212.0				

TABLE No. 17.—*Statistics of the Cocorite Leper Asylum, Port of Spain, Trinidad, 1909–1915.*

[Source: Annual reports of the surgeon general of Trinidad]

Years ending Mar. 31—	Population of colony.	Lepers admitted.	Deaths.	Remaining at end of year.	Rate per 1,000,000.
1909	317,513	60	38	251	790.5
1910	323,828			273	813.0
1911	330,270	65	34	273	826.6
1912	336,839	90	38	285	846.1
1913	343,408	96	39	283	824.1
1914	348,958	98	25	300	859.7
1915	355,627	110	47	318	894.2

TABLE No. 18.—*Admissions to the Cocorite Leper Asylum, Port of Spain, Trinidad, according to nativity, Apr., 1909–Mar. 31, 1915.*

[Source: Annual reports of the surgeon general of Trinidad and Tobago.]

Where born.	Tubercular.	Anesthetic.	Mixed.	Doubtful and not stated.	Total.
Trinidad	86	98	8	20	212
Tobago	7	5		2	14
Grenada	1	3		2	6
Barbados	9	4	1	2	16
St. Vincent	18	6		2	26
Martinique	4			1	5
Dominica		1			1
Guadaloupe	1				1
Antigua				1	1
Nevis	1				1
St. Kitts		1		1	2
St. Bartholomew	1				1
British Guiana	3				3
Venezuela	2		1		3
Madeira		1			1
Portugal				1	1
China	1	2			3
India	37	156	10	19	222
Total	171	277	20	51	519

TABLE No. 19.—*Inmates of the public leper asylum at Mahaica, British Guiana, according to race, Apr. 1, 1913.*

[Source. Report of the surgeon general of British Guiana for the year 1912-13.]

Race.	Population of British Guiana.	Number of lepers.	Rate per 1,000,000.
Black and colored	155,624	222	1,426.5
East Indians	128,993	150	1,162.9
Chinese	2,684	1	372.6
Portuguese	10,284	13	1,264.1
White	4,011	1	249.3
Total	301,596	387	1,283.2

TABLE No. 20.—*Deaths of lepers, by form and duration of disease, in Mahaica Leper Asylum, British Guiana, 1902–1913.*

Duration of disease (years).	Tubercular.		Anesthetic.		Mixed.		Total.		Average duration of treatment.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
									Yr. Mo.	*Yr. Mo.*
Under 2	1	.....	9	.....	3	.....	13	.....	11	.....
2 to 4	25	12	63	20	9	2	97	34	2 6	1 8
5 to 9	66	24	111	40	28	3	205	67	4 4	3 9
10 to 14	48	17	90	21	20	5	158	43	6 8	6 1
15 and over	13	6	69	32	13	5	95	43	11 5	13 4
Unknown	13	13	74	29	10	3	97	45	2 1	2 2
Total	166	72	416	142	83	18	665	232	5 3	5 4

[1] Average duration of disease: Tubercular—Male, 8 years 10 months: female, 8 years 10 months. Anesthetic—Male, 10 years 6 months; female, 11 years 2 months. Mixed—Male, 9 years 4 months; female, 12 years 11 months. All forms—Male, 9 years 11 months: female, 10 years 7 months.

Male and female: Tubercular, 8 years 10 months; anesthetic, 10 years 8 months; mixed, 9 years 11 months; all forms, 10 years 1 month; average duration of treatment, 5 years 3 months.

TABLE No. 21.—*Deaths from leprosy, by sex and age, in Mahaica Leper Asylum, British Guiana, 1902–1913.*

Years.	Under 15 years.		15 to 44 years.		45 years and over.		Age not stated.		All ages.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
1902	1	.....	18	7	24	4	.....	.....	43	11
1903	.....	.....	32	8	31	8	.....	.....	63	16
1904	1	.....	23	7	20	3	.....	.....	44	10
1905	1	1	17	13	19	6	.....	.....	37	20
1906	.....	.....	36	13	27	5	.....	1	63	19
1907	1	.....	42	6	26	8	14	1	83	15
1908	1	.....	13	4	12	2	15	2	41	8
1909	.....	.....	12	5	9	.....	39	27	60	32
1910	.....	.....	1	1	1	.....	51	26	53	27
1911	.....	.....	.....	.....	.....	.....	58	30	58	30
1912	2	.....	35	15	35	13	11	8	83	36
1913	.....	1	24	3	13	4	.....	.....	37	8
Total	7	2	253	82	217	53	188	95	665	232

TABLE No. 22.—*Deaths of lepers, by cause, in Mahaica Leper Asylum, British Guiana, 1902–1913.*

Cause of death.	Tubercular.		Anæsthetic.		Mixed.		Total.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Leprosy	113	47.5	174	31.2	41	40.6	328	36.6
Dysentery	9	3.8	37	6.6	6	5.9	52	5.8
Tuberculosis	12	5.0	25	4.5	2	2.0	39	4.4
Cancer	1	.4	.....	.....	.....	.....	1	.1
Nervous diseases	.....	.....	19	3.4	.....	.....	19	2.1
Heart disease	7	2.9	23	4.1	1	1.0	31	3.5
Pneumonia	3	1.3	15	2.7	2	2.0	20	2.2
Other respiratory diseases	.....	.....	9	1.6	2	2.0	11	1.2
Diarrhea and enteritis	51	21.4	134	24.0	24	23.7	209	23.3
Liver diseases	2	.9	13	2.3	3	3.0	18	2.0
Bright's disease	36	15.1	74	13.3	16	15.8	126	14.0
Accident	.....	.....	5	.9	2	2.0	7	.8
Suicide	.....	.....	.....	.....	1	1.0	1	.1
All other causes	4	1.7	30	5.4	1	1.0	35	3.9
Total	238	100.0	558	100.0	101	100.0	897	100.0

TABLE No. 23.—*Deaths from leprosy and number of inmates in the leper asylums of Venezuela, 1905–1912.*

[Source: Anuario Estadistico de Venezuela.]

Year.	Population.	Deaths from leprosy in Venezuela.	Rate per 1,000,000.	Inmates in leper asylums Dec. 31.	Rate per 1,000,000.
1905	2,608,033	81	31.1	.....	.....
1906	2,627,434	74	28.2	.....	.....
1907	2,646,835	51	19.3	666	251.6
1908	2,666,236	37	13.9	632	237.0
1909	2,685,637	48	17.9	621	231.2
1910	2,705,038	22	8.1	612	226.2
1911	2,724,439	24	8.8	611	224.3
1912	2,743,840	62	22.6	582	212.1

TABLE No. 24.—*Mortality from leprosy in the city of Rio de Janeiro, 1891–1912.*

[Source: Annuario de Estatistica Demographo-Sanitaria, 1912.]

Year.	Population.	Deaths.	Rate per 1,000,000.	Year.	Population.	Deaths.	Rate per 1,000,000.
1891	440,118	13	29.5	1902	571,728	19	33.2
1892	450,636	14	31.1	1903	585,695	20	34.1
1893	461,411	20	43.3	1904	600,067	23	38.3
1894	472,454	18	38.1	1905	614,831	25	40.7
1895	483,773	18	37.2				
1891–1895	2,308,392	83	36.0	1901–1905	2,930,451	103	35.1
				1906	625,756	22	35.2
1896	495,380	19	38.4	1907	636,018	34	53.5
1897	507,286	18	35.5	1908	637,089	20	31.4
1898	519,503	13	25.0	1909	649,362	14	21.6
1899	532,042	22	41.4	1910	699,781	11	16.4
1900	544,917	10	18.4				
1896–1900	2,599,128	82	31.5	1906–1910	3,218,006	101	31.4
				1911	708,669	29	40.9
1901	558,140	16	28.7	1912	749,376	25	33.4

TABLE No. 25.—*Mortality from leprosy in the Federal District of Rio de Janeiro, by age and sex, 1910–1912.*

[Source: Annuario de Estatistica Demographo Sanitaria, 1912.]

Age.	Males.			Females.		
	Population.	Number of deaths.	Rate per 1,000,000.	Population.	Number of deaths.	Rate per 1,000,000.
Under 15	471,503	1	2.1	406,394	.....	.....
15–19	145,960	3	20.6	127,310	2	15.7
20–29	363,953	9	24.7	231,580	6	25.9
30–39	258,332	7	27.1	166,750	1	6.0
40–49	172,627	13	75.3	114,175	3	26.3
50–59	85,621	8	93.4	66,410	6	90.3
60–69	35,305	4	113.3	34,618	3	86.7
70 and over	13,755	.....	.....	18,800	1	53.2
Unknown	33,631	.....	.....	21,555	.....	.....
All ages	1,580,688	45	28.5	1,187,592	22	18.5

TABLE No. 26.—*Mortality from leprosy in the city of Pernambuco, Brazil, 1907–1912.*

[Source: Annuario de Estatistica Demographo Sanitaria, Rio de Janeiro, 1912.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1907	159,480	18	112.9	1911	186,000	3	16.1
1908	166,110	19	114.4	1912	210,000	10	47.6
1909	172,740	12	69.5				
1910	179,370	12	66.9	1907–1912	1,073,700	74	68.9

TABLE No. 27.—*Mortality from leprosy in the city of Sao Paulo, Brazil, 1904–1912.*

[Source: Annuario Estatistica Demographo-Sanitaria, Rio de Janeiro, 1912.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1904	307,600	6	19.5	1908	336,400	11	32.7
1905	314,800	7	22.2	1909	343,600	6	17.5
1906	322,000	17	52.8	1910	350,800	23	65.6
1907	329,200	11	33.4	1911	358,000	21	58.7
1904–1907	1,273,600	41	32.2	1908–1911	1,388,800	61	43.9
				1912	400,000	24	60.0

TABLE No. 28.—*Number of lepers in Iceland, by age and sex, 1901.*

[Source: Sammandrag af statistiske Oplysninger om Island, Koebenhavn, 1907.]

Age.	Males.			Females.		
	Population.	Number of lepers.	Rate per 1,000,000.	Population.	Number of lepers.	Rate per 1,000,000.
Under 20	17,326	4	230.9	16,805	.....	.....
20–39	10,561	30	2,840.6	11,653	8	686.5
40–59	6,464	18	2,784.7	7,728	19	2,458.6
60 and over	3,044	8	2,628.1	4,620	7	1,515.2
Not stated	188	.....	.....	81	.....	.....
All ages	37,583	60	1,596.5	40,887	34	831.6

NOTE.—The reports of the district physicians show 133 lepers in 1901.

TABLE No. 29.—*Number of lepers in Iceland, by age and sex, 1910.*

[Source: Manntal a Islandi, 1. December, 1910, gefid ut af Stjornarradi Islands. Reykjavik, 1913.]

Age.	Males.			Females.		
	Population.	Number of lepers.	Rate per 1,000,000.	Population.	Number of lepers.	Rate per 1,000,000.
Under 20	19,141	2	104.5	18,391	.....	.....
20–39	11,060	10	904.2	11,800	7	593.2
40–59	7,542	19	2,519.2	8,870	10	1,127.4
60 and over	3,219	7	2,174.6	4,905	9	1,834.9
Unknown	143	.....	.....	112	.....	.....
All ages	41,105	38	924.5	44,078	26	589.9

NOTE.—The above table is derived from the census report of Iceland of 1910. The reports of the district physicians show that there were 82 lepers in Iceland in 1910, or 963 per 1,000,000 population. Fifty-one of the lepers were segregated in a leper asylum near Reykjavik.

TABLE No. 30.—*Number of lepers in Norway, 1856–1910.*

[Source: Norges officielle Statistik, v. 161, De Spedalske i Norge, Kristiania, 1912.]

Year.	Population.	Number of lepers.	Rate per 1,000,000.	Year.	Population.	Number of lepers.	Rate per 1,000,000.
1856	1,494,000	2,858	1,913.0	1905	2,315,000	474	204.8
1875	1,803,000	1,752	971.7	1906	2,330,000	445	191.0
1885	1,930,000	1,195	619.2	1907	2,345,000	438	186.8
1890	1,982,000	960	484.4	1908	2,360,000	394	166.9
1895	2,063,000	688	333.5	1909	2,375,000	360	151.6
1900	2,240,000	577	257.6	1910	2,390,000	323	135.1

TABLE No. 31.—*Number of lepers in Norway, by domicile, 1910.*

[Source: Norges officielle Statistik, v. 161, De Spedalske i Norge, Kristiania, 1912.]

Province.	Population.	Number of lepers.	Rate per 1,000,000.
Kristiania City	241,884	5	20.7
Akershus	128,042	3	23.4
Smaalenene	152,306	.....	.....
Buskerud	123,643	.....	.....
Jarlsberg and Larvig	109,076	.....	.....
Bratsberg	108,084	.....	.....
Nedenes	76,456	.....	.....
Lister and Mandal	82,067	1	12.2
Total southern Norway	1,021,508	9	8.8
Kristians Amt	119,236	1	8.4
Hedermarken	134,555	5	37.2
Total interior Norway	253,791	6	23.6
Stavanger	141,040	9	63.8
Söndre Bergenshus	146,006	56	383.5
Nordre Bergenshus	90,040	72	799.6
Romsdal	144,622	40	276.6
Söndre Trondhjem	148,306	32	215.8
Bergen City	76,867	12	156.1
Total western Norway	746,881	221	295.9
Nordre Trondhjem	84,948	24	282.5
Nordland	164,687	51	309.7
Tromsö	81,902	8	97.7
Finmarken	38,065	4	105.1
Total northern Norway	369,602	87	235.4

TABLE No. 32.—*Average age of lepers at beginning of disease and duration of the disease in the leper asylums of Norway, 1901–1910.*

[Source: Norges officielle Statistik, v. 161, De Spedalske i Norge, Kristiania, 1912.]

Year.	Average age at the beginning of the disease.		Average duration, in years, of the disease.	
	Tubercular leprosy.	Anesthetic leprosy.	Tubercular leprosy.	Anesthetic leprosy.
1901–1905	31.8	33.1	11.5	30.2
1906–1910	31.3	31.0	16.1	34.9

NOTE.—The tubercular form of leprosy is decreasing more rapidly than the anesthetic form. The number of persons suffering from the two forms is now about equal.

TABLE No. 33.—*Number of lepers in Norway, by sex and age, at the end of 1910.*

[Source: Norges officielle Statistik, v. 161, De Spedalske i Norge, Kristiania, 1912.]

Age.	Males.	Females.	Total.	Age.	Males.	Females.	Total.
5–10	1	.....	1	60–70	20	29	49
10–15	.....	1	1	70–80	14	29	43
15–20	3	3	6	80–90	4	6	10
20–30	6	16	22	90–100	.....	2	2
30–40	16	13	29	Unknown	29	19	48
40–50	20	33	53				
50–60	24	35	59	Total	137	186	323

TABLE No. 34.—*Mortality from leprosy in Norway, by age and sex, 1906–1910.*

[Source: Norges officielle Statistik, v. 161, De Spedalske i Norge, Kristiania, 1912.]

Age.	Males.	Females.	Total.	Age.	Males.	Females.	Total.
15–20	6	2	8	70–80	23	14	37
20–30	6	2	8	80–90	14	14	28
30–40	18	12	30	90–100	.....	2	2
40–50	22	11	33	Unknown	12	8	20
50–60	11	5	16				
60–70	16	13	29	Total	128	83	211

TABLE No. 35.—*Number of inmates in the leprosariums of Norway, 1856–1913.*

[Source: Norges officielle Statistik, Sundhedstilstanden og Medicinalforholdene. 1913.]

Year.	Population of Norway.	Number of inmates.	Rate per 1,000,000.	Year.	Population of Norway.	Number of inmates.	Rate per 1,000,000.
1856	1,494,000	235	157.3	1905	2,315,000	253	109.3
1875	1,803,000	623	345.5	1910	2,390,000	203	84.9
1885	1,930,000	522	270.5	1911	2,405,000	191	79.4
1890	1,982,000	507	255.8	1912	2,420,000	177	73.1
1895	2,063,000	360	174.5	1913	2,435,000	177	72.7
1900	2,240,000	298	133.0				

NOTE.—This table shows that not all the lepers of Norway are segregated in asylums. See table No. 30.

TABLE No. 36.—*Number of lepers in Sweden, 1907–1913.*

[Source: Sveriges officiella Statistik, Allmän Hälso och Sjukvård.]

Year.	Population.	Number of lepers.	Rate per 1,000,000.	Year.	Population.	Number of lepers.	Rate per 1,000,000.
1907	5,406,615	87	16.1	1911	5,561,799	66	11.9
1908	5,445,211	73	13.4	1912	5,601,195	67	12.0
1909	5,483,807	73	13.3	1913	5,640,591	65	11.5
1910	5,522,403	72	13.0				

TABLE No. 37.—*Lepers in Sweden at the end of 1912, according to place of origin.*

[Sources: Sveriges officiella Statisti.. Allmän Hälso och Sjukvård År 1912.]

Province.	Population.	Number of lepers.	Rate per 1,000,000.
Stockholm city	346,848	2	5.8
Stockholm County	232,390	1	4.3
Upsala County	129,965	1	7.7
Kalmar County	231,323	1	4.3
Gottland County	35,990	2	35.7
Göteborg and Bohus Counties	386,608	1	2.6
Älvsborg County	291,720	1	3.4
Kopparberg County	237,147	20	84.3
Gävleborg County	257,345	31	120.5
Västernorrland County	254,019	5	19.7
Jämtland County	163,625	2	12.2
Other Provinces	3,014,215	.....	0.0
Total	5,601,195	67	12.0

NOTE.—The two infected Provinces, Kopparberg and Gävleborg, are situated in the north-central part of the country from the Baltic to the Norwegian frontier.

TABLE No. 38.—*Number of lepers in Finland, 1910.*

[Source: Medicinalstyrelsens Berättelse for År 1910, Helsingfors, 1912.]

	Population.	Number of lepers.	Rate per 1,000,000.
Males	1,546,694	42	27.2
Females	1,568,503	38	24.2
Total	3,115,197	80	25.7

NOTE.—During 1910 there were 7 new cases and 9 deaths from leprosy.

TABLE No. 39.—*Number of lepers in Prussia, 1911.*

[Source: Das Gesundheitswesen des Preussischen Staates im Jahre 1911.]

Province.	Population.	Number of lepers.	Rate per 1,000,000.	Province.	Population.	Number of lepers.	Rate per 1,000,000.
Königsberg	916,533	[1] 85	92.7	Other Provinces	37,170,041	.....	0.0
Gumbinnen	606,950	1	1.6	Total	40,500,283	90	2.2
Arnsberg	544,660	1	1.8				
Cöln	1,262,099	3	2.4				

[1] All in the district of Memel.

TABLE No. 40.—*Number of lepers in Spain, 1904.*

[Source: Dr. Ph. Hauser. La Geografia Medica de la Peninsula Iberica.]

Province.	Population.	Number of lepers.	Rate per 1,000,000.	Province.	Population.	Number of lepers.	Rate per 1,000,000.
Alicante	475,684	117	246.0	Pontevedra	464,552	27	58.1
Cadiz	457,683	1	2.2	Sevilla	568,028	34	59.9
Castellon	314,632	70	222.5	Tarragona	336,978	9	26.7
Cordoba	469,774	21	44.7	Valencia	825,106	122	147.9
Coruna	655,046	21	32.1	All other Provinces	12,740,660	.....	0.0
Granada	497,035	27	54.3				
Huelva	277,489	6	21.6	Total	18,589,016	522	28.1
Malaga	506,349	67	132.3				

NOTE.—The Canary Islands are not included in the above table. During the years 1901–1906 there were 75 deaths from leprosy in the Canary Islands, giving an annual death rate of 32.9 per 1,000,000 population.

TABLE No. 41.—*Mortality from leprosy in Italy, 1896–1912.*

[Source: Statistica delle cause di morte nell 'anno 1912, Roma, 1914.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.	Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1896	31,506,302	17	0.5	1906	33,325,098	10	0.3
1897	31,716,313	21	.7	1907	33,514,702	10	.3
1898	31,926,334	27	.8	1908	33,826,688	9	.3
1899	32,136,350	14	.4	1909	34,077,068	14	.4
1900	32,346,366	11	.3	1910	34,376,609	20	.6
1896–1900	159,631,670	90	.6	1906–1910	169,120,165	63	.4
1901	32,533,337	6	.2	1911	34,688,814	19	.5
1902	32,690,510	5	.2	1912	35,026,486	17	.5
1903	32,839,509	11	.3				
1904	33,016,234	12	.4				
1905	33,193,289	12	.4				
1901–1905	164,281,879	46	.3				

TABLE No. 42.—*Number of lepers and mortality from leprosy in Bosnia and Herzegovina, 1906–1912.*

[Source: Jaehrliche Berichte ueber die Verwaltung von Bosnien und Hercegovina.]

Year.	Population.	Number of deaths.	Rate per 1,000,000.	Number of lepers.	Rate per 1,000,000.
1906	1,634,082			150	91.8
1907	1,709,072	24	14.1	135	79.4
1908	1,766,062	15	8.5	135	76.4
1909	1,832,053	27	14.7	129	70.4
1910	1,898,044	10	5.3	130	68.5
1911					
1912	1,962,411			116	59.1

TABLE No. 43.—*Statistics of the leper farm at Nicosia, Cyprus, 1906–1914.*

[Source: The Governor's Annual Reports.]

Year.	Population.	Number of deaths.	Rate per 1,000,000.	Inmates on Dec. 31.	Rate per 1,000,000.
1906	256,490			99	386.0
1907	260,199	11	42.3	100	384.3
1908	263,908	5	18.9	102	386.5
1909	267,617	11	41.1	102	381.1
1910	271,326	15	55.3	99	364.9
1911	275,035	9	32.7	99	360.0
1912	278,744			97	348.0
1913	282,453	14	49.6	95	336.3
1914	286,162	10	34.9	97	339.0

TABLE No. 44.—*Number of lepers in Egypt, according to the census of 1907, by sex.*

[Source: The census of Egypt taken in 1907; Cairo, 1909.]

	Population.	Number of lepers.	Rate per 1,000,000.
Males	5,616,640	4,287	763.3
Females	5,573,338	2,226	399.4
Total	11,189,978	6,513	582.0

TABLE No. 45.—*Number of lepers in Egypt, according to the census of 1907, by Provinces.*

	Population.	Number of lepers.	Rate per 1,000,000.
GOVERNORATES.			
Cairo	654,476	54	82.5
Alexandria	332,246	101	304.0
Port Said	49,884	2	40.1
Suez	18,347	.....	0.0
Ismailia	11,448	4	349.4
El Arish	5,897	10	1,695.8
Sinai	1,510	.....	0.0
PROVINCES.			
Behera	798,473	1,022	1,279.9
Gharbia	1,484,814	707	476.2
Daquahlia	912,428	568	622.5
Sharquia	879,646	899	1,022.0
Menufia	970,581	316	325.6
Qualiubia	434,575	302	694.9
Total, lower Egypt	5,480,517	3,814	695.9
Giza	460,080	169	367.3
Beni Suef	372,412	152	408.2
Fayum	441,583	262	593.3
Minia	659,967	308	466.7
Assiut	903,335	445	492.6
Girga	792,971	655	826.0
Quena	772,492	487	630.4
Aswan	232,813	50	214.8
Total, upper Egypt	4,635,653	2,528	545.3

TABLE No. 46.—*Cases of leprosy treated in the hospitals and dispensaries of Sierra Leone, 1908–1913.*

[Source: Annual Reports of the Medical Department of Sierra Leone.]

Year.	Population.	Cases.	Rate per 1,000,000.	Year.	Population.	Cases.	Rate per 1,000,000.
1908	75,896	27	355.7	1911	75,572	48	635.2
1909	75,788	12	158.3	1912	75,464	34	450.5
1910	75,680	26	343.6	1913	75,356	47	623.7

TABLE No. 47.—*Cases of leprosy treated in the hospitals and dispensaries of the Gold Coast Colony, 1910–1913.*

[Source: Annual Medical and Sanitary Reports of the Government of the Gold Coast.]

Year.	Population.	Cases.	Rate per 1,000,000.	Year.	Population.	Cases.	Rate per 1,000,000.
1910	857,922	40	46.6	1913	845,454	64	75.7
1911	853,766	43	50.4				
1912	849,610	34	40.0	1910–1913	3,406,752	181	53.1

Type of disease, 1913:
Tubercular 54
Anesthetic 10

TABLE No. 48.—*Number of lepers in Zanzibar and Pemba, 1909.*

[Source: Report of the Public Health Department, Zanzibar, 1909.]

	Population.	Number of lepers.	Rate per 1,000,000.
Zanzibar	115,477	178	1,541.4
Pemba	83,437	129	1,546.1
Total	198,914	307	1,543.4

TABLE No. 49.—*Number of lepers in the leper asylums in the Union of South Africa, Dec. 31, 1912.*

[Source: Statistical Yearbook of the Union of South Africa, 1913.]

	Cape of Good Hope.		Natal, Amatikulu.	Transvaal, Pretoria.	Total.
	Robben Island.	Emjanyana.			
White males	60	.....	.....	60	120
White females	32	.....	.....	32	64
Colored males	349	329	100	401	1,179
Colored females	171	316	75	299	861
Total	612	645	175	792	2,224

NOTE.—As the population of the Union of South Africa was 6,125,000 on Dec. 31, 1912, there were 363.1 lepers in leper asylums per 1,000,000 population.

TABLE No. 50.—*Mortality from leprosy in Mauritius, 1890–1914.*

[Source: Annual Reports of the Registrar General of Mauritius.]

Year.	Population.	Deaths.	Rate per 1,000,000.	Year.	Population.	Deaths.	Rate per 1,000,000.
1890	370,562	66	178.1	1903	370,522	34	91.8
1891	370,604	35	94.4	1904	370,299	30	81.0
1892	370,646	54	145.7	1905	370,076	27	73.0
1893	370,689	59	159.2	1906	369,853	11	29.7
1894	370,732	59	159.1	1907	369,630	5	13.5
1895	370,775	54	145.6	1908	369,407	20	54.1
1896	370,818	33	89.0	1909	369,183	21	56.9
1897	370,861	41	110.6	1910	368,959	14	37.9
1898	370,904	62	167.2	1911	368,735	23	62.4
1899	370,947	44	118.6	1912	368,512	20	54.3
1900	370,990	32	86.3	1913	368,289	21	57.0
1901	370,968	48	129.4	1914	368,066	1	2.7
1902	370,745	39	105.2				

TABLE No. 51.—*Number of lepers in India at each of the last four censuses, 1881–1911.*

[Source: General Report of the Census of India, 1911.]

	Population, 1911.	Rates per 100,000.							
		Males.				Females.			
		1881	1891	1901	1911	1881	1891	1901	1911
I. PROVINCES.									
Burma	12,115,217	101	117	56	79	33	52	25	37
Assam	6,713,635	96	182	125	90	38	60	39	32
Bengal	45,483,077	141	104	69	56	51	36	23	19
Bihar and Orissa	34,490,084	103	82	76	71	29	26	24	23
United Provinces	47,182,044	63	58	36	48	16	13	11	11
Central Provinces and Berar	13,916,308	103	91	78	58	39	39	38	33
Madras	41,405,404	67	53	54	62	25	18	17	20
Coorg	174,976	25	13	6	6	22	14	4	.....
Bombay	19,672,642	75	69	38	52	29	24	15	23
Ajmer Merwara	501,395	9	7	8	3	3	3	3	2
Punjab	13,974,956	65	37	26	17	22	13	11	8
Northwestern Frontier Province	2,196,933	23	16	18	17	11	7	10	8
Baluchistan	414,412	.....	.....	.....	14	.....	.....	.....	5
II. STATES AND AGENCIES.									
Sikkim	87,920	.....	.....	55	16	.....	.....	25	40
Central India Agency	9,356,980	.....	.....	6	19	.....	.....	4	9
Cochin	918,110	27	66	57	73	23	31	25	28
Travancore	3,428,975	.....	53	68	49	.....	22	28	16
Hyderabad	13,374,676	42	39	4	41	18	13	2	15
Mysore	5,806,193	16	22	17	18	9	11	8	8
Baroda	2,032,798	39	2	18	31	17	15	10	12
Rajputana Agencies	10,530,432	.....	21	6	9	.....	7	3	3
Kashmir	3,158,126	.....	.....	72	59	.....	.....	36	26
All India	315,156,396	84	68	48	51	29	23	17	18

NOTE.—The total number of lepers in India, 1911, was 109,000.

TABLE No. 51a.—*Mortality from leprosy in Ceylon, 1910–1914, by race.*

[Source: Administration Reports of Ceylon, Vital Statistics.]

Race.	Population.	Deaths from leprosy.	Rate per 1,000,000.
Europeans	38,605	.....	0.0
Burghers	134,905	4	29.7
Sinhalese	13,761,410	256	18.6
Tamils	5,348,670	53	9.9
Moors	1,352,420	22	16.3
Malays	65,495	2	30.5
Total	20,709,505	337	16.3

TABLE No. 52.—*Lepers treated in the leper asylum at Pulau Jerejak, Straits Settlements, during the year 1914, according to race, compared with the population of Straits Settlements and Perak.*[1]

[Source: Annual Report on the Medical Department, Straits Settlements, for the year 1914.]

Race.	Population.	Cases.	Rate per 1,000,000.	Race.	Population.	Cases.	Rate per 1,000,000.
Hokkien	191,453	7	386.5	Tamils	119,671	47	392.7
Cantonese	158,766	191	1203.0	Other East Indians	35,923	4	111.3
Teochiu	70,438	75	1064.8	Malays	408,042	3	7.4
Kheh	96,992	158	1629.0	Javanese	30,801	.....	.....
Hailam	30,838	28	908.0	Eurasians	8,917	1	112.1
Other Chinese	38,562	.....	.....	Other races	17,723	.....	.....
Total Chinese	587,049	526	896.0	Total	1,208,126	581	480.9

[1] Of the 581 cases 542 were from Perak or Straits Settlements.

TABLE No. 53.—*Lepers treated in the leper asylum at Pulau Jerejak, Straits Settlements, during the year 1914, according to occupation.*

[Source: Annual Report on the Medical Department, Straits Settlements, for the year 1914.]

Occupation.	Cases.	Per cent.	Occupation.	Cases.	Per cent.
General coolie	204	35.1	Cook	6	1.0
Mining coolie	181	31.2	Trader	6	1.0
Gardener	29	5.0	Fisherman	5	0.9
Carpenter	23	4.0	Barber	4	0.7
Woodcutter	15	2.6	Actor	2	0.3
Blacksmith	13	2.2	Other occupations	70	12.1
Tailor	9	1.5			
Cart driver or puller	8	1.4	Total	581	100.0
Rikisha puller	6	1.0			

NOTE.—The occupational census statistics of Straits Settlements are too incomplete to serve for comparison with the above figures.

TABLE No. 54.—*Leprosy treated in the hospitals of the Federated Malay States, 1910–1914.*

[Source: The Annual Medical Reports for the Federated Malay States.]

Year.	Population.	Admissions to hospitals.		Deaths from leprosy.		Remaining at end of year.	
		Number.	Rate per 1,000,000.	Number.	Rate per 1,000,000.	Number.	Rate per 1,000,000.
1909	955,553	.....	.....	.....	.....	468	489.8
1910	1,001,257	486	485.4	162	161.8	523	522.3
1911	1,045,947	404	386.3	136	130.0	512	489.5
1912	1,109,017	374	337.2	139	125.3	547	493.2
1913	1,117,625	.....	.....	.....	.....	544	486.7
1914	1,125,000	443	393.8	119	105.8	564	501.3

TABLE No. 55.—*Mortality from leprosy in Japan, 1907–1911.*

[Source: Mouvement de la population de l'Empire du Japon.]

Year.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1907	48,492,085	1,889	39.0
1908	49,045,240	1,944	39.6
1909	49,591,360	1,935	39.0
1910	50,137,480	1,585	31.6
1911	50,683,600	1,623	32.0
1907–1911	247,949,765	8,976	36.2

Year.	Males.			Females.		
	Population.	Deaths from leprosy.	Rate per 1,000,000.	Population.	Deaths from leprosy.	Rate per 1,000,000.
1907	24,440,011	1,344	55.0	24,052,074	545	22.7
1908	24,708,992	1,412	57.1	24,336,248	532	21.9
1909	24,974,209	1,445	57.9	24,617,151	490	19.9
1910	25,249,235	1,117	44.2	24,888,245	468	18.8
1911	25,524,261	1,210	47.4	25,159,339	413	16.4
1907–1911	124,896,708	6,528	52.3	123,053,057	2,448	19.9

TABLE No. 56.—*New cases of leprosy in the Commonwealth of Australia, 1907–1911.*

[Source: Official Year Book of the Commonwealth of Australia, 1913.]

Year.	Population.	New cases.	Rate per 1,000,000.
1907	4,123,729	26	6.3
1908	4,194,410	28	6.7
1909	4,274,617	14	3.3
1910	4,370,185	14	3.2
1911	4,490,366	11	2.4
1907–1911	21,453,307	93	4.3

Dr. HOFFMAN. In this connection an important question has been raised as regards the probable foreign origin of most of the cases reported for this country. Dr. Parker, of the Penikese colony, has been good enough to furnish me with an extremely interesting statement, in detail, regarding the 11 cases now at the island and 13 cases formerly under treatment. If this table is desired for the record, and I think it should be included, I have to request that the names of the patients be omitted, and with your permission I will now strike out the names so that they will not be printed.

The CHAIRMAN. We will include the table without the names.

(The table referred to, without the names, is here printed in full, as follows:)

List of cases of leprosy at Penikese Hospital Feb. 12, 1916.

No.	Present age.	Sex.	Civil status.	Family.	Nativity.	Apprehended.		Time in United States prior to discovery.
						When.	Where residing.	
								Years.
1	34	Male	Mother	1 son in China	Chinese	June 6, 1904	Boston	2–3
2	35	do	do	Wife	do	Jan. 18, 1905	Newburyport.	3
3	35	Female	Son	Father, mother, 3 sisters in Russia; brother in Concord; uncle in Cambridge.	Russian (Lettish).	July 13, 1907	Brookline.	7
4	70	Male	Wife	2 sons	Russian (Hebrew).	Mar. 19, 1909	Boston	7
5	50	Female	do	1 daughter in New Bedford; 1 son, 1 daughter in Brava.	Cape de Verde.	Dec. 16, 1909	New Bedford.	12
6	51	do	Mother	Husband	Italy	May 10, 1911	Boston	4
7	27	Male	Son	Father living	Cape de Verde.	Nov. 9, 1912	East Norton.	4
8	40	do	Mother	Wife, 2 children	Chinese	Mar. 7, 1913	Boston	8
9	41	do	Son		Japanese	Jan. 17, 1911	do	3
10	28	do	do	2 brothers, 1 uncle in Boston.	Russian (Hebrew).	Nov. 7, 1913	Malden	7
11	27	do	do		Greek	Nov. 8, 1915	Boston	3½

No.	Form or type of disease.	Present stage of disease.	Estimated chances of life (a guess).	Occupation.	History: Admitted to Penikese.
			Years.		
1	Tubercular	Far advanced; not in final stage.	3	Laundryman	Nov. 18, 1905
2	do	Far advanced	4	do	Nov. 16, 1905
3	do	Well advanced	4	Domestic	July 24, 1907
4	do	Far advanced	1	Teacher of Jewish language.	Mar. 27, 1909
5	Anesthetic	Early stage	10–15	Housewife	Dec. 19, 1909
6	Tubercular	Far advanced	3	do	May —, 1911
7	do	Second stage; medium advanced.	8	Laborer; cranberry picker.	Nov. 10, 1912
8	Tubercular macular	Second stage	7	Cook	Mar. 13, 1914
9	Tubercular	Last stage	1	Carpenter and general laborer.	Jan. 23, 1911
10	do	Second stage	7	Brushmaker	Nov —, 1913
11	do	First stage	12	Dishwasher	Nov. 18, 1915

List of all previous cases of leprosy treated or cared for at Penikese Hospital, 1904–1915.

No.	Age at discovery.	Sex.	Civil status.	Family.	Nativity.	Apprehended.		Time in United States prior to discovery.
						When.	Where residing.	
								Years.
1	38	Male....	Mother..	Wife, 8 children....	Cape de Verde.	Apr. 22, 1904	Harwich....	12
2	34	...do....	Son.....	.....	.....do.....	Aug. 14, 1904	Boston.....	14
3	26	Female .	Wife....	4 children; fourth born at Penikese.	.....do.....	Feb. 22, 1905	Wareham...	3½
4	54	Male....	Mother..	Wife, 2 children....	American, New Orleans.	Oct. 29, 1905	Hyde Park..	(1)
5	23	...do....	Son.....	.....	Trinidad....	Feb. 1, 1907	Somerville..	2
6	41	...do....	Mother..	Wife, 5 children...	Russian.....	Aug. 27, 1907	East Boston.	4
7	19	Female .	Son.....	.....	.....do.....	Sept. 2, 1907	Brookline...	2
8	17	Male....	...do....	Mother.....	Barbados...	Mar. 22, 1909	Upton.....	7
9	25	...do....	...do....	.....	Greek.....	Apr. 24, 1909	State Infirmary.	2
10	55	...do....	Mother..	.....	Russian.....	May 11, 1912	Boston.....	20
11	34	...do....	Son.....	.....	Azores.....	June 26, 1912	New Bedford.	1½
12	30	...do....	Mother..	Wife and son in China.	Chinese.....	June 12, 1912	Boston.....	10
13	72	...do....	...do....	Wife and 1 child...	American...	Dec. 9, 1915	Bourne.....	32

No.	Form or type of disease.	Occupation.	History.	
			Admitted to Penikese.	Disposition.
1	Tubercular.....	Stevedore and laborer.....	Nov. 18, 1905	Died Nov. 19, 1914.
2	.....do.....	Sailor.....	Nov. 16, 1905	Died 1907.
3	.....do.....	Housewife.....	Nov. 29, 1905	Died Mar. 13, 1915.
4	.....do.....	Clerk and accountant.....	Dec. —, 1906	Died Nov. 7, 1912.
5	Mixed.....	Clerk.....	May 31, 1907	Died Aug. 8, 1913.
6	Tubercular.....	In leather factory.....	Aug. 19, 1907	Died Oct. 22, 1915.
7	.....do.....	Domestic.....	1907	Deported.
8	.....do.....	Student in high school....	Mar. 27, 1909	Died Feb. 17, 1915.
9	.....do.....	Cook.....	Apr. 24, 1909	Deported.
10	.....do.....	Painter.....	May 11, 1912	Mar. 21, 1913, discharged for treatment elsewhere.
11	.....do.....	Laborer.....	June 28, 1912	Deported Aug. 13, 1912.
12	Anesthetic and macular....	Laundryman.....	June 15, 1912	Released Jan. 3, 1914.
13	Anesthetic.....	Mariner and bookkeeper...	Dec. 19, 1915	Died Jan. 23, 1916.

[1] Always

Dr. HOFFMAN. It is shown by these tables that most of the cases of leprosy treated at Penikese were either Orientals or Portuguese, chiefly from the Western Islands. You, of course, are familiar with the fact that there is quite a Portuguese population in southeastern Massachusetts. With your permission I will read off the nativity of the patients under treatment, as follows: One Chinese, another Chinese, one Russian, another Russian, one Portuguese, one Italian, one Portuguese, one Chinese, one Japanese, another Russian, and a Greek. In other words, Mr. Chairman, at the present time there is not a single American-born leper in the colony. All of the cases, broadly speaking, are interstate or international cases, the patients having not been born and probably having not contracted the disease in Massachusetts, and, perhaps, not in this country. The facts are practically the same for the earlier cases, except that there was one from New Orleans, another from Trinidad, and another from Barbados, illustrating the

menace of the West Indies as regards the introduction of new cases of leprosy into this country. You may recall that the Jersey City case referred to at the outset of my remarks had originally been exposed to the disease in the West Indies, and the second case had come from Key West. The Senator from California asked a questime some time ago as regards the controlling power of the Federal Government over lepers at large in this country, and I would like to suggest to the committee that Dr. McCoy be requested to explain concisely the operations of the Federal quarantine law as well as the rules and regulations of the Public Health Service regarding the transportation of lepers in interstate traffic. The amendment with reference to the interstate quarantine regulations regarding the transportation of lepers in interstate traffic was promulgated by the Treasury Department under date of May 15, 1912, and published by the Public Health Service in Public Health Report No. 84 of that year.

Senator WORKS. There would be no doubt, Doctor, about the right of the Government to deal with interstate cases, but the important question is whether these cases are not all interstate cases; that is to say, whether there is not a danger at all times of transmitting the disease from one State to another, which, of course, would involve the question of absolute Government jurisdiction over all these cases. Take such cases as have been mentioned here, where the patient goes from one State to another and is shunted back into his own State; that, obviously, is an interstate matter, with which the Government should be able to deal.

Dr. HOFFMAN. With reference to this question, Senator, I would say that I am willing to commit myself to the point of view that almost all of the cases of which I personally have knowledge have an interstate aspect to them.

The CHAIRMAN. Speaking of the interstate aspect of these cases, Doctor, what provision does the Government make for soldiers who return from the Philippines who had been discharged and who, subsequent to their discharge, have developed leprosy?

Dr. HOFFMAN. As far as I know the Federal Government makes practically no provision for these unfortunates other than such as very special circumstances may require. There was a well-known case of a soldier leper at Savannah who for a number of years was properly taken care of in an isolated situation, as I recall it, near Fort Screven.

The CHAIRMAN. Did the leprosy develop after his discharge?

Dr. HOFFMAN. No; I think not, Senator. As I recall the case the leprosy developed previous to discharge, and he was therefore still in the service.

The CHAIRMAN. I was wondering if there was any provision made by the Federal Government for cases of leprosy in soldiers developing after their discharge.

Dr. HOFFMAN. As far as I know, there is no such provision, although quite a number of cases are on record where soldiers have developed the disease after they returned from the Philippines. There are, I believe, three such cases at the San Francisco settlement at the present time.

The CHAIRMAN. The Early case, as I understand it, belongs to this class?

Dr. HOFFMAN. Yes, Senator; that would seem to be so. There appears to be no question about Early having contracted the disease in the Philippines during military service; but he is now being taken care of by the government of the District of Columbia—at the expense of the District.

Senator WORKS. I suppose the Government would have no further responsibility after his discharge than it would have toward any other American citizen.

The CHAIRMAN. Perhaps not; but the disease was incurred in the performance of the soldier's duty to the Government and to the people, and, since we do not hesitate to pay a substantial pension to the soldiers of the Civil War, there would seem to be no reason why some Government obligation does not exist in the case of these men.

Senator WORKS. Oh, yes; there would seem to be some moral obligation, but I meant legally. I call attention to that interstate or international phase of the Government's obligation, because of the efforts being made—a good many of them—to involve the Government in appropriations for expenses which, I think, properly belong to the States. We are going a long way now in that direction, because of the necessities of the States for financial help from the Government; but this question is on quite a different footing, I conceive.

Dr. HOFFMAN. In reply to the statement made by the Senator from California, I shall, with your permission, put into the record an extract from a letter of mine to the president of the Prudential, Mr. Forrest F. Dryden, written to him during my stay at Molokai, on March 11, 1915:

> I believe no country is doing more for this unfortunate class (lepers) than Hawaii. It is not, however, in my opinion, a local, but a Federal matter. With all possible reluctance to see an extension of the Federal health activities in this direction, I can not but feel that the United States Government should take this entire matter in hand for the mainland and its insular possessions. Leprosy is a more serious menace than is generally assumed. There is more of it on the mainland than appears on the surface on the basis of inadequate statistics. On the mainland the treatment of these unfortunates is often brutal in the extreme, where isolated cases can not be well treated under present conditions. There is need of the taking over of the leper settlements in Louisiana, California, Massachusetts, Hawaii, etc., by the United States Public Health Service—to be controlled by the Federal Government and completely maintained at the expense of the Nation. The burden upon the Territory of Hawaii is very heavy—out of proportion to its means—and the rapid eradication of the disease can not take place under present conditions. I firmly believe that we have an interest in the matter, and that we should cooperate with the United States Public Health Service toward this end.

The foregoing extract, Senator, should make it clear that I am personally opposed to any unnecessary extension in the direction of Government aid in behalf of cases, however worthy, which can be properly taken care of by the several States. My own investigations into this subject of leprosy, however, have made it clear that the problem of control is essentially one of interstate and Federal concern.

With your permission, I would like to include in the record the following statement regarding the 104 lepers who at the present time are being cared for at the Louisiana settlement. The number of new cases admitted during 1914 was 21. Of the 92 native-born lepers in the Louisiana home 48 gave their birthplace as New Orleans, and the remainder came from 25 different parishes. Aside from the 92 born in Louisiana, 11 were born in other States of the United States; that

is, Florida, Kentucky, Missouri, North Carolina, Pennsylvania, and Texas; 12 came from foreign countries, as follows: China, 1; Denmark, 1; France, 2; Germany, 1; Ireland, 2; Italy, 2; Jamaica, West Indies, 1; Mexico, 1; Norway, 1; and for 4 the information could not be obtained.

Senator Works. The conditions in Louisiana are quite different from other parts of the country, are they not, Doctor? In other places most of the lepers are foreigners, are they not? Take Massachusetts, for example?

Dr. Hoffman. Yes; they are nearly all foreigners.

Senator Works. And that is true very largely for California, is it not?

Dr. Hoffman. Yes, Senator; all of the details regarding the lepers at the San Francisco Isolation Hospital are contained in the list previously put into the record, according to which only 3 out of 15 lepers were native born.

The Chairman. How is it in New York?

Dr. Hoffman. I regret to say I have no very definite knowledge as regards the lepers apprehended or cared for in New York City; but my recollection is that most of them are foreign born or from other States with a record of exposure in the Philippines or the West Indies.

Senator Works. How do you account for that condition? In other words, how do you account for the fact that there are so many native-born people of Louisiana that are afflicted with the disease?

Dr. Hoffman. Leprosy has been endemic in Louisiana for more than a hundred years. It may possibly have been brought there by the Acadians after their expulsion from Nova Scotia. It is certainly a curious coincidence that the disease should be endemic among the French Canadians in the Maritime Provinces and also among the French Acadians in Louisiana. They are, as a rule, but not always, of the poorest of the French element, and they usually come from sparsely settled sections in the Gulf parishes. It is not often that a case occurs among the more advanced class of people, but occasionally such cases are met with.

Senator Works. Is that accounted for in any way by experts on the subject?

Dr. Hoffman. I would not like to commit myself to any medical theories, for as yet there is not, broadly speaking, a concensus of qualified opinion. It would seem, however, that economic well-being, material prosperity, and attention to the requirements of a rational personal hygiene are the safest precautions against leprosy. Absolute bodily cleanliness, a nutritious diet, and a healthy mode of life otherwise seem to afford adequate protection to the white attendants who are in daily, and even hourly, contact with lepers in all stages of the disease.

I have here a very interesting document which you may wish to include in the record. It is the original examination paper used in Hawaii in connection with the examination of lepers for final commitment to the settlement. It is a document which reflects the humanity as well as the high order of intelligence of the Territorial government in thoroughly protecting anyone against possible errors in the medical and bacteriological diagnosis of the disease. The ex-

amination of the suspected person is invariably made by three physicians and these must agree in their findings, and in addition thereto the bacteriological evidence must be conclusive.

The CHAIRMAN. We will include that paper.

(The paper referred to is here printed in full, as follows:)

Original examination record of Board of Health of Hawaii.

1. Name, ———.
2. Nationality, ———. Sex, ———. Age, ———. Civil state, ———.
(Classify according to predominant strain.)
3. Hawaiian blood, ———. Place of birth, ———.
(State as nearly as possible what proportion.)
4. Occupation, ———.
(State nature of present and former occupations and time and place of such occupations.)
9. Present and former residences, ———.
(State particularly places and length of residence in the different localities in the Hawaiian Islands.)
16. Date of arrival in Hawaiian Islands, ———.

FAMILY HISTORY.

17. Father, ———.
18. Name, ——— {Dead. / Living.} Leper {Yes. / No.} Age, ———.
Nationality, ———.
(Predominant strain.)
19. Residence, ———. Occupation, ———.
(If dead, state former occupation.)
20. Additional facts, ———.
(State whether brothers or sisters or father or mother of father were lepers, giving their names and as full information in regard thereto as possible, and association of this patient therewith.)
26. Mother, ———.
27. Name, ——— {Dead. / Living.} Leper {Yes. / No.} Age, ———.
Nationality, ———.
(Predominant strain.)
28. Residence, ———. Maiden name, ———.
29. Additional facts, ———.
(State whether brothers or sisters or father or mother of mother were lepers, giving their names and as full information as possible in regard thereto and association of this patient therewith.)
34. Brothers, ———.
(Mark those not living with a cross thus, X.)
35. Name, ———. Age, ———. Married, ——— (give maiden name of wife). Residence, ———.
43. Additional facts, ———.
(State full particulars such as would be required of this patient as to those of the above who have been or are lepers.)
54. Sisters, ———.
(Mark those not living with a cross thus, X.)
55. Name, ———. Age, ———. Married, ——— (give maiden name of wife). Residence, ———.
63. Additional facts, ———.
(State full particulars such as would be required of this patient as to those of the above who have been or are lepers.)
74. Wife. Maiden name, ——— {Living. / Dead.}
75. Husband. Name, ——— {Living. / Dead.}
76. Residence, ———. Date of marriage, ———.
77. Married more than once, ———.
(If married more than once, give names of husbands, or wives' maiden names and dates of marriages.)

79. Additional facts, ———.
(If any wife is or has been a leper, go fully into the facts and insert them here, stating when first symptoms appeared, etc.)
91. Children, ———.
(Mark those not living with a cross, thus, x.)
92. Name, ———. Age, ———. Sex, ———. Married, ——— (name of husband, or wife's maiden name). Residence, ———.
100. Additional facts, ———.
(State particulars, such as would be required of this patient in regard to those above who have been or are lepers. Also set forth the children of the above and all particulars in regard to them, and if such children have been or are lepers, follow the same course in regard to them as indicated in case of one having leprosy.)
116. Any intimate associates, past or present, leprous? ———.

PERSONAL HISTORY.

124. Date of earliest symptom, ———.
125. Character of earliest symptom, ———.
126. Location of earliest symptom, ———.
127. Subsequent progress, ———.

CLINICAL HISTORY.

132. Face, ———. Back, ———.
133. Eyebrows, ———. Arms, ———.
134. Ears, ———. Hands, ———.
135. Nose, ———. Fingers, ———.
136. Facial paralysis, ———. Thigh, ———.
137. Neck, ———. Leg, ———.
138. Chest, ———. Feet, ———.
139. Abdomen, ———. Toes, ———.

NOTES.

140. ———.

BACTERIOLOGICAL FINDINGS.

143. ———.

——— ———, M. D.,
Bacteriologist, Board of Health.

DIAGNOSIS.

145. Type: Tubercular. Anæsthetic. Mixed.
(Underline type.)
147. Date admitted to Kalihi Hospital, ———.
148. Date transferred to Leper Settlement, Molokai, ———.

——— ———, M. D.,
Medical Superintendent.

Dated: Kalihi Hospital the ——— day of ———, 19—.

LIFE HISTORY.

NOTE.—This should be gone into fully and in detail, tracing every association and incident in the life of the patient which has any bearing on the pathological side of his case. While every effort is expected to be made to secure this as soon as the patient is admitted to the hospital, it is appreciated that there are limitations on the information which may be secured in the inception of the treatment of the patient. It is expected, therefore, that further information will be secured and added hereto as treatment at the hospital progresses and will be added on the other blank sheets furnished for the purpose.

——— ———, M. D.,
Medical Superintendent.

Dated: Kalihi Hospital, the ——— day of ———, 19—.

Dr. HOFFMAN. I would also like to put into the record a statement with regard to the truly remarkable decrease of leprosy in Norway since segregation was introduced and made relatively effective. In

1856 the number of lepers in Norway was 2,858, which by 1910 had progressively decreased to 323. In proportion to population the leprosy rate in 1856 was 191 per 100,000 against only 13.5 in 1910.

The CHAIRMAN. To what do you ascribe that decrease?

Dr. HOFFMAN. Largely, if not entirely, to segregation. In the opinion of all the authorities on leprosy which I have knowledge of, segregation is the only plausible explanation. In Iceland where the disease had been increasing for a number of years it was also ultimately brought under control by segregation and the Government leprosarium at Reykjavik is considered a model institution, which reflects the attained civilization of that remote island possession of Denmark.

The CHAIRMAN. Does the general rule seem to be that where you do not have segregation the disease gradually increases and that where you have segregation it gradually decreases?

Dr. HOFFMAN. Yes, Senator; that, broadly speaking, would appear to be the case.

Senator WORKS. What is the effect of climate upon leprosy?

Dr. HOFFMAN. Climate per se, as far as I know, has no direct relation to leprosy at all. The disease occurs from the tropics to the arctic regions. More than half a thousand years ago it prevailed extensively over the entire European continent. Under tropical conditions, where life is so much easier and where the people are more apt to ignore hygienic precautions it can readily be understood why leprosy should be more common and less easily eradicated than in temperate zones. The food among primitive people is also, as a rule, often wanting in variety and nutritious qualities. It is claimed by some that a fish diet predisposes to leprosy, but this would seem to be extremely doubtful. Leprosy is not met with in Newfoundland or Labrador, although the people there live almost exclusively on a fish diet. A few sporadic cases have occurred in Alaska, possibly introduced from the Orient.

The CHAIRMAN. How about race?

Dr. HOFFMAN. Race would seem to have an important bearing upon the relative frequency of leprosy among the different types of mankind. I have here a statement of the mortality from leprosy in Hawaii by race, based upon the statistics for 1911–1914. According to this information the leprosy mortality rate was 15.2 per 10.000 of population for pure Hawaiians, 1 for Part Hawaiians, 0.8 for Portuguese, 1.5 for the Chinese, 0.1 for Japanese, and 0.2 for all others, which, of course, includes all Caucasians other than Portuguese. For all races combined the leprosy mortality rate was 2.5 per 10,000. In the aggregate during this period there were 157 deaths from leprosy, and of this number 131 were pure Hawaiians, 4 Part Hawaiians, 6 Portuguese, 11 Chinese, 3 Japanese, and only 2 were of some other Caucasian race than Portuguese.

Senator WORKS. I think it is generally believed, however, that the disease is more prevalent in tropical climates.

Dr. HOFFMAN. Yes, Senator; that is unquestionably true, but the reason is not, in all probability, the climate, but the fact that the type of people chiefly predisposed to leprosy on account of their habits or mode of life are so much more numerous in tropical regions than among our more active, industrious, and robust population. As

I have just pointed out, in Hawaii leprosy is almost exclusively limited to Hawaiians, part Hawaiians, and Chinese.

The CHAIRMAN. Have you any statistics as regards the white and negro races in Louisiana?

Dr. HOFFMAN. Yes, Senator; in proportion to population there is less leprosy in Louisiana among the negroes than among the whites.

The CHAIRMAN. There is less among the negroes?

Dr. HOFFMAN. Yes, Senator; there is less among the negroes in proportion to population than among the whites.

The CHAIRMAN. How do you account for that?

Dr. HOFFMAN. I can not account for it, except on the ground that the foci of the disease has for many years been chiefly among the natives of French extraction, who have very little, if any, direct contact with the negro population in those particular parishes in which the disease is most common, and in which, in fact, the proportion of negroes to the total population is relatively small.

According to the official statistics for the Leper Home the number of inmates as of April 16, 1914, has been 70.2 per million of white population and 20.3 per million of colored population.

The CHAIRMAN. You might give us the actual numbers if you can do so.

Dr. HOFFMAN. During the period 1912–1914—that is, the last biennial period for which the information has been published—there were 60 white male lepers admitted and 34 white female lepers, or a total of 94 white persons, against 14 colored male lepers and 9 colored female lepers, or a total of 23 admissions of persons of color.

Senator WORKS. What is the proportion of population as between colored and white races in Louisiana?

Dr. HOFFMAN. The proportion of white population is 56.8 per cent and the proportion of white lepers admitted during 1912–1914 is 80.3 per cent. The proportion of colored population is 43.2 per cent and the proportion of colored lepers admitted during 1912–1914 is 19.7 per cent. It is therefore quite clear that the leprosy rate among the negroes is less than it is among the whites.

In this connection, Mr. Chairman, your committee may be interested in the following statement with reference to the comparative leper rate for this and other countries. On the basis of the official returns for the year 1914 the leper rate per 100,000 of population was 4.9 for Louisiana, 48.6 for the Philippine Islands, 122.3 for British Guiana, and 301.2 for the Territory of Hawaii.

The CHAIRMAN. What relation is there between leprosy and insanity, if any, Doctor?

Dr. HOFFMAN. Apparently there is no such relation, although there are a few demented persons at all the leper settlements of which I have knowledge. Naturally, as the terminal stage of the disease is approached, the mind gives way with the body. Suicide seems to be very rare among lepers, for in the experience at Molokai, during a long period of years, there have been very few cases of self-murder.

The CHAIRMAN (interposing). Practically, then, there is no definite relation between leprosy and insanity, as far as you know?

Dr. HOFFMAN. Not as far as I know of; but as I have just said, naturally, as the lepers attain old age, they become more helpless and occasionally reach the stage of senile dementia.

The CHAIRMAN. Being a statistician, Doctor, I suppose you have found considerable trouble about getting statistics of leprosy in the United States, have you not?

Dr. HOFFMAN. We, of course, have difficulty in obtaining all the required information for a thorough and conclusive study of the subject. As far as I know, a complete analysis of the data either for Hawaii or Louisiana has not thus far been attempted. For the United States our information is quite inconclusive, because of the fact that in many of the States the disease is not reportable. As I may have said before, according to official reports made to me, there are about 150 lepers known to the health authorities of this country, and about two-thirds of this number are at the Leper Home in Louisiana.

The CHAIRMAN. Will you make your statement a little more explicit as regards the difficulties in the way of securing a complete statement of the number of lepers in the United States, excluding our noncontiguous possessions?

Dr. HOFFMAN. In the first place, Senator, I am of the opinion that the diagnosis of the disease is frequently erroneous. Leprosy is so rare that many physicians never see a case during their entire experience. When met with in isolated cases a final diagnosis is necessarily made with much reluctance. A physician this morning testified that cases frequently come to a hospital where they are disagnosed superficially as skin diseases of one kind or another. Even more frequently the disease is confused with syphilis, and in some cases with erysipelas. As the disease approaches a terminal stage and the patient grows worse the disagnosis is, of course, made with less difficulty.

In this connection I desire to refer back to my previous statement as regards 80 cases of leprosy reported by skin specialists for the city of Chicago. I am informed by Dr. John Dell Robertson, commissioner of health, as follows [reading]:

> I feel safe in saying that nearly all skin specialists have seen cases of leprosy, and that it is their common experience that these cases come for treatment until the patients are told the true nature of their disease. Upon receiving this information they usually stop coming to the specialist or disappear, and probably in time show up at some other place. When this habit of lepers is taken into consideration the large number of supposed cases reported from time to time in large cities may dwindle considerably on account of the duplication resulting from one patient being treated from time to time in a number of dispensaries. During the last two or three years we have had from one to two lepers in our isolation hospital. Cases have also been discovered in our suburbs, and attempts have been made to isolate the same.

In view of the foregoing explanation I add the concluding sentence of the letter by Commissioner Robertson [reading]:

> We therefore welcome the establishment of a national leprosarium in accordance with the terms of Senate bill 4086.

The CHAIRMAN. Have we any means or special statutory methods with regard to the collection of statistics of leprosy in the United States?

Dr. HOFFMAN. No, Senator; the only method available to us as regards a reasonably complete census of leprosy for the mainland of the United States is for the United States Public Health Service to enlist the cooperation of the entire medical profession and request

reports of leprosy cases under treatment, with such qualifications, of course, as may be necessary in very doubtful or merely suspected cases.

Senator WORKS. Is not an effort made by the United States Census Bureau?

Dr. HOFFMAN. The Division of Vital Statistics of the United States Census Bureau collects vital statistics only for the so-called registration area, which includes about two-thirds of the total population, and less than one-half of the entire area of the country. It so happens that the States for which no vital statistics are at present being published are also the States in which leprosy is most common. That, of course, is chiefly true for Louisiana. The mortality returns for the registration area, for illustration, do not include the returns for the Louisiana Leper Home.

The CHAIRMAN. You spoke earlier in your evidence of the occasional inhumanity to lepers apprehended while in interstate transit, and you have heard what Dr. Engman has said about this important matter. Do you believe that for similar reasons there are a good many cases of leprosy in the United States with regard to which the facts are withheld on account of the possibility of inhuman or otherwise improper treatment?

Dr. HOFFMAN. I should think so, Senator, because the individual cases which I have taken note of during the last 20 years prove conclusively that there is a most unreasonable attitude on the part of the public, needlessly apprehensive as to the possibility of infection. In quite a number of cases lepers have been hounded from one part of the country to the other and doctors have time and again been afraid to make a positive diagnosis for fear of getting themselves and their patients into trouble. In other words, a positive diagnosis of leprosy is only made when there is obviously no alternative; but where there is the least suspicion of doubt there is naturally reluctance to subject or expose the patient to the certainty of more or less inhuman and otherwise wrongful treatment in the absence of adequate provision for segregation and institutional care.

The CHAIRMAN. I wish, Doctor, you would give us some actual illustrations.

Dr. HOFFMAN. May I read to you a statement in reply to your question, Senator?

The CHAIRMAN. Certainly.

Dr. HOFFMAN. The following is from an address which I delivered last year before the American Academy of Medicine on the leprosy problem in San Francisco [reading]:

> The present hazardous and more or less superficial and inhuman treatment has been a matter of public record for more than 20 years. Cases after cases have temporarily attracted public attention, but being few in number and often far between they have not resulted in the development of a sound national sentiment favorable to the national control of the disease under suitable conditions of segregation. For illustration: There was a case of leprosy in Columbus, Ohio, in 1898, which subsequently resulted in another case, the origin of the disease being traced to the father, who, it was claimed, had contracted leprosy during the Civil War.
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> In 1899 Dr. Herbert C. Moffatt exhibited a leper in the city of New York who had probably contracted the disease in Cuba or among the Aleutian Indians of Alaska. The patient in this case was himself a physician.
>
> In 1906 a case occurred in West Virginia which attracted much attention on account of the wanderings or interstate movements of the leper, which

should early and promptly have required Federal interference. The case was found in a remote section of the State, and it was reported at the time that "the public of the district where the leper is now sojourning was panic-stricken, and he has been much neglected, but the county has now taken him in charge and will, it is said, build him a house and will otherwise provide for him." It would be difficult to conceive of a less satisfactory method regarding both the leper and the public at large. The treatment of leprosy requires special attention and a thorough understanding of the symptoms and the course of the disease, which are not likely to be met with in the case of the ordinary practitioner, least of all in a remote section of a State like West Virginia. Even in Washington, D. C., when the Early case first came under observation the method of providing for his care was crude, but the public alarm was not unjustified. It was reported at the time that the street cars in which he was thought to have traveled were thoroughly disinfected and every house in which he was known to have been was fumigated.

It may be said in this connection that such precautions merely indicate how the disease may be spread in the course of time through entirely unsuspected channels of infection. Even after the positive diagnosis has been made the average duration of the disease is from 8 to 10 years. In some cases lepers have lived for 20 and even 30 years under proper treatment. How long a period intervenes between the first infection and the first positive diagnosis is at present unknown.

In continuation I quote from the address referred to [reading]:

Some six years ago the United States Army had an isolated leper, who was taken care of at Fort Screven, near Savannah, Ga. The leper was a first sergeant, and a cottage was built for him, where, as far as practicable, he had every necessary medical attention. The sergeant submitted with patience to every treatment, but under such conditions of isolation it is readily conceivable that the suffering must have been needlessly greater and the chance of a cure much less than if adequate provision had been made for this patient in a modern leprosarium.

In 1910 a woman leper was found in the city of New York who had come from Baltimore two weeks previous, where the board of health had been making strenuous efforts for her apprehension and isolation. As reported in the New York newspapers at the time, sequestration or isolation would not be required in her case in the city of New York under the assumption that "the chances of communicating the disease are so slight as to make isolation unnecessary."

In other words, because of easy-going methods not in conformity to modern scientific theories regarding leprosy contagion New York City attracts apparently lepers from other parts of the country, and there can be no serious doubt about this being the case. [Reading:]

Perhaps the most interesting recent case occurred in Pawtucket, R. I., where a 15-year-old schoolboy was first discovered to be a leper in one of the isolation wards of the Massachusetts General Hospital—where he had gone for treatment. As reported in the newspapers at the time, "when the news of the case became known in Pawtucket, it caused tremendous alarm, especially in families whose children were attending the same school." The home of the boy was surrounded by policemen, and complaint was made by the school-teacher that she was being shunned on account of her possible contact with the boy, who was subsequently being taken care of by the Rhode Island authorities.

In the same year (1911) a case of leprosy was discovered in Pittsburgh. The man, who was found afflicted with leprosy, was a Chinese bookkeeper in a Chinese store. He was taken to the municipal hospital and placed temporarily in a tent until a separate house could be erected for him.

Also in 1911 a case was discovered in Minneapolis, where a leper was found to have suffered from the disease for 12 years. The case was not diagnosed as leprosy until the man died—when an autopsy was performed. At about the same time a case of leprosy was discovered in Jersey City, N. J., which terminated in death, following isolation or segregation of only a few weeks preceding.

In Paterson, N. J., there was discovered a Chinaman leper, ill in a laundry, who died a few days later at the Isolation Hospital. It was reported at the time that he was supposed to be one of two lepers who had escaped from the city quarantine station at North Brother Island.

Recalling that the Grable case had its apparent beginning in Idaho, the following case is of special interest [reading]:

A family of lepers was found on a ranch in Idaho, consising of the father, the mother, and the two children. The father had been in Honolulu some years before, and, no doubt, contracted the disease in the islands.

At about the same time a case of leprosy was discovered in Fort Wayne, Ind.—a Syrian woman who had but three weeks before come from Hawaii, where she had contracted the disease.

There is also on record the case of a young man, 18 years of age, who for four years was afflicted with the tubercular form of leprosy, and who was taken care of in Brooklyn Hospital for Contagious Diseases. The boy was the son of a tobacco merchant living at Key West, Fla., where he no doubt contracted the disease, possibly through West Indian sources.

A noted case from an interstate point of view was that of a Greek leper found in Chicago, who had escaped from quarantine in Salt Lake City, but who ultimately succeeded in passing through to New York.

Finally, mention may be made of the case of a widow of a general in the United States Army, who died from leprosy at the county hospital at Los Angeles. She had formerly been living in Arizona and other sections of the United States.

As regards any and all of these cases I have had to rely upon general newspaper information, but I have no reasons for questioning that, in the main, the statements are in accordance with the facts.

Other cases could be mentioned to further emphasize the early conclusion that isolated instances of leprosy suggest the inadequacy and danger of any and all methods of treatment other than complete segregation in a leprosarium under either Federal or State control. The time has passed for academic discussion, and the time for definite action has come. The evidence is overwhelming that leprosy exists in this country to a much larger extent than is generally assumed to be the case, and that the risk of the introduction of the disease from South America, the West Indies, the Philippines, and the Orient must be considered as much more of a menace at the present time than in former years. A carefully considered plan for national segregation, treatment, and control has been for several years before Congress, and a new measure likely to be brought forward in support of this proposition is entitled to public confidence and active support. The early enactment of such a measure is called for by the highest considerations of public policy.

All of the cases which have been cited and many others which are a matter of record have a more or less obvious interstate and international aspect, and precisely illustrate the point that adequate treatment was not, as a rule, furnished, or feasible, and that, aside therefrom, lepers have frequently been treated in an inhuman and inconsiderate manner because of the unjustified apprehension on the part of the public.

The CHAIRMAN. Have you known of cases where the treatment was really inhuman? I do not mean where there was intentional unkindness, but where the leper was treated with neglect or needless exposure on account of fright and danger to the public.

Dr. HOFFMAN. In many of the cases quoted, but especially the one in West Virginia and the one in Rhode Island, the patients were certainly subjected to much indignity and needless terror. In the notorious Grable case the man was certainly subjected to more or less mental stress and physical strain, because he was not wanted anywhere, and to provide for him at a Federal quarantine was found impracticable, even though the Federal authorities were quite willing to do what was necessary. I have time and again been told in

confidence of very trying cases, of forcible attempts at deportation, or of interstate transportation in the case of lepers apprehended in one section of the country but properly chargeable as regards their care and treatment to another section.

The CHAIRMAN. Such unfortunate occurrences would, of course, be impossible if there were a national leprosarium to which these people could be sent. There would then be no inducement to do these inhuman things.

Dr. HOFFMAN. I strongly share your views, Senator, because it would seem only reasonable that this conclusion would follow. In Hawaii there are no more harrowing scenes; and in many cases the lepers of their own accord go to the receiving station just outside of Honolulu for preliminary examination and detention. I saw a boy there who came of his own free will to request an examination. In the earlier years, when the accommodations at Molokai were very poor and when much needless force was used in separating husbands from wives and parents from children, the lepers were naturally reluctant to go to Molokai; but that condition is absolutely of the past. Under the humane and rational rules which govern the settlement, married lepers at Molokai are permitted to continue living together, even though one of the parties may be, and often is, a "clean" person. When a child is born of such marriages the child is at once taken from the mother and removed to a children's home (in the settlement), where it is cared for from one to two years, until removed to an institution in Honolulu. The leprous mother can see the child as often as desired while at the settlement, but she can not come in contact with the same, and afterwards the child can visit the mother and see the same at the visitors house, but the two can not touch each other or come in personal contact in any way. By means of this precaution children of lepers have been practically protected in nearly all cases against the risk of leprosy. At the Louisiana settlement the male lepers live apart from the female lepers, which the experience at Molokai has shown is neither desirable nor necessary. I am of the opinion that the less done to make the settlement resemble a prison or an institution the better. At Molokai the general appearance of the settlement is that of a pleasant country village, with churches, stores, schools, etc., and the lepers therefore feel as near at home as it is possible for them to do.

What we are most urgently in need of in this country is a national sentiment on the subject of leprosy, which is a disease essentially different from practically every other affliction of mankind. We have to make the leper realize that when he finds himself afflicted with this disease the only adequate treatment and proper care can be had in a National or State leprosarium; in fact, there is no difficulty in this respect when such an institution is available, as is the case in Louisiana, at San Francisco, and at Penikese Island, Mass. Lepers voluntarily go to these institutions because they know full well that they can not receive the skillful treatment and humane nursing and care at their homes or in some isolated room of a county hospital or poorhouse.

During my stay at Molokai the conviction was forced upon me that much harm had been done to the cause of leper care by the exaggerated stories of Father Damien and the alleged horrors of the disease. Every now and then the newspapers announce the reso-

lution of some priest or nun or lay brother or sister to go to Molokai as "a living grave." All this is a wrongful perversion of the public understanding of the facts. Any one of the attendants at Molokai can go to Honolulu if he cares to, or to the mainland, of his own free will and accord. Dr. McCoy, who is in this room, spent many months at Molokai, going forward and backward between the settlement and Honolulu. During his whole stay at the Kalihi Hospital he was never interfered with on his return to the city. There is no particular amount of extreme self-sacrifice or personal heroism involved in the nursing of lepers, other than the very remote but, of course, frightful risk of infection which is necessarily incurred. Of the three white men who have contracted the disease at the Molokai settlement in the care of lepers, one was Father Damien, the second a Brother of the Order of St. Francis, who possibly may have been a leper on admission, and the third was a Belgian, still living, but probably certain to die of the disease. There are at the present time some 51 well persons living at the settlement, including 13 persons connected with the United States lighthouse, including wives and children; 5 Sisters of the Order of St. Francis, 2 priests, 2 lay brothers, and other nurses and servants, as well as the superintendent, the resident physician, and his wife and children.

At the Bishop Home, under the care of the sisters, are 58 leper women, yet none of the sisters in the entire experience of the settlement has contracted the disease. The same conclusion applies to the Louisiana Leper Home, and to the Lazaretto at Tracadie. The plain truth about the matter is that these sisters, as well as all the other white attendants in charge, live clean, active, and truly Christian lives. Nowhere have I seen more of the genuine spirit of Christianity, of self-sacrificing charity, and true goodness of heart than among the Catholic sisters at the leper settlement in Louisiana and among the physicians, sisters, and attendants at Molokai. The same conclusion applies to Dr. A. A. O'Neill, in charge of the Isolation Hospital of San Francisco, who has only 1 helper to care for 15 lepers, some of whom are in the terminal and absolutely helpless stage of the disease. All of these, personally known to me, and countless others connected with leper settlements throughout the world perform a truly Christian service in behalf of a most afflicted portion of mankind.

The CHAIRMAN. You think, then, Doctor, that a great deal of the public horror and fright regarding leprosy is illfounded?

Dr. HOFFMAN. In a large measure, Senator, this is true. Personally I have never had any fear of the disease; nor, for that matter, of contagion in any other disease. I certainly have decidedly less fear of leprosy than of smallpox, scarlet fever, tuberculosis, or typhoid fever. No very special precautions are being taken at Molokai, and yet, as I have said before, there have been no cases of leprosy directly traceable among the attendants, other than the three cases referred to, which, in their nature, were quite exceptional. At the Louisiana Leper Home they take more precautions, and I can not but feel that this is advisable. No very special precautions are employed at San Francisco; but at all of these institutions everything reasonable is done to protect the attendants and the public. No leper, for illustration, at Molokai ever enters the house of a well person; no leper ever touches a well person; no article of food, either

used by lepers or by well persons, is ever handled or manipulated by a leper. At the San Francisco Isolation Hospital an almost ideal arrangement has been evolved by Dr. O'Neill, which is well worthy of study on the part of those who have to maintain leper settlements in connection with other institutions. Each and every one of the attendants, of course, incurs a risk, and the same applies to those who make a scientific study of the disease. The risk, however, is simply a part of life, for without it there would be no progress in either science or humanity.

The CHAIRMAN. Do you mean to say, then, that it is extremely rare for an attendant at a leprosarium to contract the disease?

Dr. HOFFMAN. Yes, Senator; and I may say that I have thoroughly gone into this matter at different times. The superintendent of the settlement at Molokai, Mr. J. D. McVeigh, has been at the settlement between 15 and 20 years, and Dr. William J. Goodhue, the attendant physician, has been there about the same time. Sister Mary Ann, who is the sister superior, has been there, I believe, 23 years; Brother Dutton, in charge of the Baldwin Home, has been there 20 years or more. At the Louisiana settlement, Sister Benedictine has been in charge for quite a number of years, while Dr. Ralph Hopkins and Dr. Isadore Dyer have had the institution under their immediate supervision, including weekly visits, for a long time.

The CHAIRMAN. All of these, you say, are in constant contact with the lepers?

Dr. HOFFMAN. Yes; constantly, in, of course, a limited sense of the term. The Sisters, however, perform, if necessary, the most menial service for the lepers, and they are most exposed. In the terminal stage the lepers are absolutely helpless, and the patient reaches a point where the use of the limbs is entirely lost; where the sight is gone, etc. Such a condition may last for months, and no words of mine can do justice to the sublime service rendered by the Sisters and others to these unfortunates during the last and most trying stage of the disease.

The CHAIRMAN. In writing to the various State health authorities, as testified by you a while ago, did you send a copy of the bill along with your letter, or give the substance of the bill?

Dr. HOFFMAN. No, Senator; my letters of inquiry were sent out in July last year, or long before this bill had been introduced.

The CHAIRMAN. But did you not refer to the urgency of a national leprosarium?

Dr. HOFFMAN. Yes, Senator; the title of my San Francisco address, in fact, was "Leprosy as a national problem." If the committee desires, I will insert it in the record.

(The matter referred to is here printed, in full, as follows:)

LEPROSY AS A NATIONAL PROBLEM.

At the Second International Conference on Leprosy, held in Bergen, Norway, August 16–19, 1909, the following-named countries were represented by official delegates: Argentine Republic, Belgium, Bulgaria, China, Cuba, Denmark, England, France, Holland, Italy, Japan, Portugal, Russia, Spain, Sweden, Germany, Egypt, Austria-Hungary, and the United States of America. The enumeration of these countries is sufficient to emphasize the world-wide aspects of the leprosy problem and its significance to the United States. There are, unfortunately, no trustworthy and complete statistics regarding the extent of leprosy throughout the world, and not even for the United States are the data complete and sufficient to

warrant definite conclusions. On the occasion of the congress referred to the number of lepers on the mainland of the United States was estimated at 146; for the Hawaiian Islands, 764; for Porto Rico, 17; for the Island of Guam, 19; for the Philippine Islands, 2,330; and for the Panama Canal Zone, 7; a total of 3,283 for the United States and its noncontiguous possessions. There are strong reasons for believing that the number of lepers on the mainland is much larger than the number returned by the leper census for the year referred to. No thorough inquiry has ever been made to ascertain all of the lepers even in the State of Louisiana, and it is a safe assumption that not half the true number are actually being taken care of at the leper home of that State.

Outside of the mainland of North America leprosy in the Western Hemisphere in 1909 was distributed, in part, as follows: In Cuba there were 1,297 cases; United States of Colombia, 4,152; Argentine Republic, 12,000; and the Island of Jamaica, 115. For all other islands of the West Indies and the countries of South and Central America the information was not obtainable.

In 1912 a further effort was made to determine the number of lepers in the United States and its noncontiguous possessions. The total number of new cases reported during the calendar year 1911 was 1,217, and the number of cases reported as present on January 1, 1912, was 3,478. Of this number 146 were reported for the mainland, 696 for Hawaii, 2,754 for the Philippine Islands, and 28 for Porto Rico. Cases were reported for the several States as follows: Arizona, 1; California, 23; Connecticut, 1; Florida, 2; Indiana, 1; Kansas, 1; Louisiana, 71; Massachusetts, 13; Michigan, 1; Minnesota, 18; New York, 5; North Dakota, 1; Pennsylvania, 3; Rhode Island, 1; Utah, 1; Washington, 2; and Wisconsin, 1.

The ascertainment of the extent of leprosy throughout the United States had been by means of a circular letter of inquiry, sent out by the Surgeon General of the United States Public Health Service, to the health authorities of the several States. There are no means at the present time, however, by which the true extent of leprosy can be determined with absolute accuracy. It may properly be questioned whether more than a very small fraction of the physicians throughout the country are qualified to diagnose a case of leprosy in the initial stages. It is often difficult to even diagnose a case after the disease has made considerable progress. The disease is reportable in only 19 States, as follows: Alabama, California, Connecticut, District of Columbia, Florida, Idaho, Illinois, Indiana, Iowa, Massachusetts, Nebraska, New Jersey, New York, Oregon, Pennsylvania, South Carolina, Utah, Washington, and Wisconsin. The disease is possibly reportable also in Michigan. It is apparently not reportable in the most important State, and that is Louisiana. Since only the city of New Orleans is within the registration area, deaths from leprosy throughout the remainder of Louisiana are not at present a matter of record with the Division of Vital Statistics of the Census Bureau.

The number of deaths from leprosy in the United States registration area in 1912 was 11, and in 1913 only 6. The mortality rate per 1,000,000 of population was 0.18 for 1912 and 0.09 for 1913. The largest number of known lepers on the mainland is in the State of Louisiana, where for a number of years segregation has been practiced and where the known lepers are taken care of at the leper home at Indian Camp plantation. For the last fiscal year the number of patients of record was 87 and the number of new patients received during the previous year was 25.

There has been no comprehensive statistical investigation of the frequency of leprosy throughout the world, but some exceedingly suggestive data are available for the countries with which the United States are most concerned.

In the registration area, which comprehends about 65 per cent of the total population, there were 95 deaths from leprosy during the period 1900–1913, equivalent to a mortality rate of 0.15 per 1,000,000 of population. Considering that each and every death represents a case more or less a menace as a foci of the disease, and furthermore that the statement is exclusive of the deaths at the Louisiana Leper Home, it needs no further argument to sustain the conviction that the disease requires to be given more serious public consideration.

It is true, of course, that at present the disease is of very limited extent in the United States. Even in Louisiana, where leprosy has been endemic for more than 100 years, the comparative leprosy frequency is only 4.9 per 100,000 of population, compared with 48.6 for the Philippine Islands, 122.3 for British Guiana, and 301.2 for the Territory of Hawaii. According to the last official report there were 87 lepers at the Louisiana Leper Home, equivalent to a rate of 4.9 per 100,000 of population. It is a conservative estimate that there are

probably twice that number, if not more, lepers at large, chiefly, however, in the remote and sparsely populated extreme southern parishes of the State. Of the Louisiana leper patients 51 per cent are white males, 25.9 per cent white females, 14 per cent colored males, and 9.1 per cent colored females. The average age on admission is about 38 years. The type of the disease in Louisiana is the anesthetic in 36.5 per cent of the cases for the white patients and 30.3 for the others. The remainder, or 66.8 per cent, is the mixed and nodular types combined.

In Hawaii, at the settlement of Molokai, the present number of lepers is about 660. Largely as the result of effective segregation the number of lepers in the Territory is gradually declining. The number of new cases during the decade ending with 1913 was 719, compared with 1,033 new cases during the decade ending with 1903. Of 1,060 lepers admitted during 1901–1913, 867, or 81.8 per cent, were Hawaiians or Part-Hawaiians; 98, or 9.2 per cent, were Chinese, Japanese, and Koreans; 52, or 4.9 per cent, were Portuguese; and only 27, or 2.5 per cent, were Caucasians other than Portuguese, excluding United States soldiers and sailors. In 1910 the proportion of Portuguese population of the total was 11.6 per cent, which contrasts with only 4.9 per cent of Portuguese lepers at the settlement. In the same year the proportion of other Caucasians in the population of the Territory was 11.4 per cent, which contrasts with only 2.5 per cent of lepers at the settlement. It is shown, therefore, that the disease is largely confined to the native and oriental populations of Hawaii, and that the proportion of cases among them is excessive. Out of 1,060 cases of leprosy during the period 1901–1913, 327, or 30.8 per cent, were of the anesthetic type.

As said before, leprosy in Hawaii is relatively and actually on the decline. This satisfactory result is primarily to be attributed to the effective plan of segregation at Molokai. The conditions of home life, supervision, and treatment are ideal. The settlement may safely be considered a model of its kind, and in addition thereto the Territory maintains a receiving station just outside of Honolulu for incipient or other early cases under observation. The leper law of Hawaii is both effective and humane. The complete records of each case are an admirable illustration of the scientific point of view governed by sound medical and humanitarian considerations. As yet, however, no comprehensive analysis has been made of the large amount of material in the archives of the Territorial board of health. Such an analysis would constitute a most valuable contribution toward the scientific study of leprosy, with a due regard, of course, to all the essential elements of age, sex, race, and precise place of origin.[1]

The results achieved in Hawaii find their parallel in Norway. Under a policy of effective segregation the leper rate has been gradually reduced from 191.3 per 100,000 of population in 1856 to 61.9 in 1885 and to 13.5 in 1910. A thoroughly digested statistical report is published at quinquennial periods by the Government of Norway, amplified by medical and other observations of a scientific nature.[2] As a concrete illustration of the remarkable diminution of leprosy in Norway, it may be stated that between 1857 and 1875 there were 3,062 new admissions to the leprosariums, diminishing to 1,108 during the first 10 years, to 817 during the decade following, to 327 during the 10 years ending with 1905, and to only 88 cases during the five years ending with 1910. No such comprehensive statistical account has been published regarding leprosy for either Louisiana or Hawaii.

That the lesser numerical extent of the disease on the mainland of the United States is not a justification for the neglect to give full publicity to the facts is best illustrated by reference to the twentieth report on leprosy in New South Wales for the year 1910. On January 1 of that year there were 19 persons remaining under detention at the leprosarium, and regarding these a report with extremely interesting illustrations, of some 30 pages, is published, and amplified by a precise but full account regarding each and every case. The report is a most valuable contribution to the scientific study of leprosy and deserves to be followed in every detail by the authorities responsible for the care of lepers in Louisiana, Hawaii, and elsewhere. Since 1890, when the leprosy law providing for compulsory detention became effective, 121 lepers

[1] Studies upon leprosy, by George W. McCoy, M. D., United States Public Health Bulletins Nos. 61 (July, 1913) and 66 (September, 1914).

[2] Leprosy in Norway (De Spedalske i Norge), 1906–1910. Norway, Official Statistics, vol. 161; Christiana, 1912.

have been admitted, and of this number 55, or 45.5 per cent, have died, 10 have been discharged, and 37 have been repatriated (chiefly to China), leaving 19 remaining on January 1, 1910. The cost of administration for the leprosarium at Little Bay, New South Wales, for 1910 amounted to £1,635 ($7,957), or an average per capita expense of about £90 ($438) per annum.

For the Territory of Hawaii the amount expended on account of leprosy during the year 1912 was $231,778. The number of lepers cared for during that year was 728. The average per capita cost per annum was, therefore, $318. The legislature of 1913 appropriated the sum of $412,130 for the care of lepers, including permanent improvements at the leper settlements for the two years commencing July 1, 1913. It may safely be asserted that no Government in the world carries a proportionately heavier burden on account of the care of lepers than the Territory of Hawaii. It may also be asserted without fear of successful contradiction that nowhere are lepers more effectively and humanely taken care of than at the receiving station at Kalihi, near Honolulu, and at the permanent settlement at Kalaupapa, on the island of Molokai.

These observations suggest the question as to what is being done for lepers on the mainland. As previously stated, the largest number of lepers in the United States at the present time is to be found in the State of Louisiana, but for some 20 years they have been more or less segregated at the leper home located at Indian Camp plantation about 70 miles from New Orleans. During the last decade the conditions at the settlement have been materially improved, and the provision which is now made for lepers under segregation in Louisiana conforms quite fully to those of Molokai. The settlement has not, however, a physician in constant attendance, although the number of lepers, according to the last report, was 87. The settlement is visited once a week by a qualified leprologist from New Orleans, and at other intervals if necessary. It has properly been observed that nothing will draw leper patients at large more quickly to a leprosarium "than the knowledge that the best special treatment for their trouble can be obtained only at the leper home." Some consideration, of course, requires to be given to the class of patients provided for. What is suitable and ideal for native Hawaiians, or orientals, is not necessarily the best method of accommodation or treatment for French creoles, or negroes, in Louisiana. There is no more grotesque public impression, however, than that a leper settlement is a living tomb, or a dreary, hopeless place of residence for what are considered, and properly so, perhaps the most unfortunate human beings on earth. Modern settlements such as those at Molokai and the leper home in Louisiana provide all reasonable comforts and a fair amount of entertainment, with abundant personal freedom, governed, of course, by restraints imperatively called for by broader general considerations. For these reasons it is an inhumane and wrongful State policy to permit lepers to be at large, as contrary to both their own interests and the larger interests of the community. Nor is it advisable to isolate a single leper, for both medical and humane reasons. The mere fact of absolute isolation or exceptional consideration is detrimental to the best possible treatment. It may seem incredible, but it is absolutely true that, in a general way, there is no more cheerful community than a large leper settlement such as the one at Molokai or the one in Louisiana. On the other hand, there is perhaps no more dreary and unfortunate position than that of an isolated leper, ostracized from the rest of the community and dealt with as an exceptional case. For these reasons, which, of course, could be amplified, it is of the greatest practical importance that several Federal leper settlements be established at convenient points throughout the country, for the greater comfort and more humane care of these unfortunates. What has been done in this direction by the State of Massachusetts is deserving of the highest praise, although the number of lepers in that case, according to the last report, is only 15. The station on Penikese Island is conceded to be a model of its kind, and whatever is reasonable and advantageous is being done to make the life of these unfortunates as bearable as possible. The enlightened policy of the State of Massachusetts is in marked contrast to the uncalled for and drastic action in several States where the establishment of leper settlements has been strongly opposed.

A few years ago it was suggested that a number of lepers in the State of Washington be sent to a station near Fort Thompson, on Puget Sound, but it was argued that "Puget Sound it not, and will not become, a leper colony, and there is not a spot anywhere along its shores suitable for that purpose, and any attempt by the Government to develop a leper colony would be sure to arouse the bitterest resentment." The answer to this statement is that the

essential facts of leprosy are generally misunderstood; that the disease, while unquestionably contagious, is only very mildly so, and practically not at all when reasonable sanitary requirements are complied with. On the occasion referred to the argument was advanced that Seattle was one of the most healthful cities in the world and the question was raised as to how the fact of a leper colony on Puget Sound would coincide with a campaign to advertise the healthfulness of the State. It was therefore argued that many a man "who would never know that the Sound was distinctly healthful, would know that it was the seat of a leper home—and the result would be to turn him against the entire section." In reply it may be said that the leper settlement at Penikese Island in Buzzards Bay has not in the least degree detracted from the enormous tourist and vacation traffic of that region during the summer months; that as far as known the public is paying not the slightest attention to the settlement, which is in precise conformity to the intelligence of the Massachusetts people and their humanitarian regard for the most afflicted element of the population, and that there is not the slightest possible chance that the settlement could in any manner affect the health of the near-by region. The same conclusion applies to the settlement in Louisiana, and the one at Molokai.

It is not true, as observed in the newspaper discussion referred to, that leper settlements "are invariably shunned by people." It is in fact quite difficult to keep away visitors from Molokai and the entire legislature visits the settlement once a year, without any apprehension whatever. The superintendent in charge of the settlement and the resident physician, as well as the Government experts, come and go without any let or hindrance and without the slightest apprehension regarding contagion on the part of anyone. Under proper sanitary conditions the risk of contagion is extremely slight. Leaving out of consideration the case of Father Damien, there have been only two cases of infection of white attendants at Molokai; but, much to the contrary, some of the officials in charge, including the superintendent, the resident physician, the sister superior and the Catholic brother in charge of the home for helpless cases, have been at the settlement for many years, and in daily, almost hourly, contact with cases in all stages of the disease, but happily without disastrous results.

The same conclusion applies to the settlement in Louisiana. The attending physicians are well known in New Orleans, and they are not considered in any manner and rightfully so as likely to be sources of infection. The sisters in charge visit the city from time to time without let or hindrance, and it would be absurd to consider them in any way a menace to the community. These facts and observations should be fully sufficient to convince any person of average intelligence that a leper settlement is not, and can not by its nature be, a menace to the health of the community, but, much to the contrary, its existence, granting necessity, reflects the highest humanitarianism and civilization of the community, broadminded enough, and charitable enough, to aid in its establishment and maintenance.

The maintenance appropriations for the Louisiana Leper Home, for the two years ended March 31, 1914, amounted to $46,500, but the total disbursements during the same period for all purposes, including improvement appropriations and cash donations, amounted to more than $76,000 net, or about $38,000 per annum. The total number of cases treated during the two years was 119, and the per capita expense per annum was $475. During the first 10 years after the opening of the institution the average number of new cases admitted was 7.7, which compared with an average of 14.3 cases during the eight years ending with 1913. It is properly observed in the last biennial report that the most important factor in the exceedingly difficult problem of isolation "is an institution recognized by the medical profession and the public as a place to which lepers can be sent with the full confidence that they will receive the best care and be offered the greatest prospect of amelioration or cure." The same reasoning applies to the need of national institutions on a similar scale to provide adequate and humane treatment for the few lepers in sections in which the disease is less common than in Louisiana or Hawaii.

To much the same effect are the words of the Surgeon General of the United States Public Health Service, Dr. Rupert Blue, in an address on "The public-health aspects of leprosy in the United States," read before the American Medical Association in 1913. Dr. Blue remarks that "Every case of leprosy should be promptly reported to the proper health authority, and, wherever necessary, the laws should be so amended and penalties provided for nonobservance. All lepers should be segregated in such manner as to prevent the spread

of the disease, but the necessary segregation should be enforced so as to promote the comfort and happiness of those so afflicted." Reasoning from this fundamental principle of national control, Dr. Blue suggests that "On account of the difficulty of providing these conditions in towns, counties, and States where single cases of leprosy occur, and because of consequent inadequate methods of control, I believe there should be established under the Public Health Service a national leper home for the care and treatment of such cases as may be turned over by State and local health authorities for the purpose."

A bill was accordingly introduced into Congress (H. R. 1751) providing for the establishment of a national leprosarium. In his evidence before the Committee on Interstate and Foreign Commerce (there being no public-health committee of the House of Representatives) Dr. Blue made the statement that at that time (Dec. 15, 1914) leprosy existed in 18 States of the Union, and that while in some States the disease was notifiable, in others it was not; and that while for himself he was convinced of the necessity of segregation, he was sorry to say that some health officers did not believe in drastic methods of control. Dr. Blue presented the following resolution, adopted by the section on dermatology, of the American Medical Association, June 24, 1914:

[Resolutions favoring the passage of a Federal law for the care and control of leprosy in the United States, adopted by the section on dermatology of the American Medical Association, Atlantic City, N. J., June 24, 1914.]

To the honorable house of delegates of the American Medical Association:

"The section on dermatology of the American Medical Association respectfully submits the following resolutions, which have been unanimously adopted by the section on June 24, 1914:

"Whereas leprosy exists in many foci in this country, and has been statistically shown to be on the increase; and

"Whereas those afflicted with leprosy are being subjected to most inhuman treatment; and

"Whereas many lepers are traveling in interstate traffic because of the inhuman treatment to which they are subjected, thereby constantly exposing the general public to the contagion; and

"Whereas it is the duty of the Federal Government to control traffic between the States; and

"Whereas at the present time the care of lepers in the United States is a great economic burden on the individual States and is, moreover, of necessity inadequate from a medical and sanitary standpoint: Therefore be it

"*Resolved*, That the association recommends the passage by Congress of a law for the comprehensive care and control of leprosy by the Federal Government."

This resolution is in conformity to the accepted principles of leprosy control adopted by the Second International Conference on Leprosy, held in Bergen, Norway, August 16–19, 1909. The resolutions adopted by the conference read in part:

"A. (1) The Second International Scientific Conference on Leprosy confirms in every respect the resolutions adopted by the First International Conference of Berlin, 1897. Leprosy is a disease which is contagious from person to person, whatever may be the method by which this contagion is effected. Every country, in whatever latitude it is situated, is within the range of possible infection by leprosy, and may, therefore, usefully undertake measures to protect itself. (2) In view of the success obtained in Germany, Iceland, Norway, and Sweden, it is desirable that other countries should isolate lepers. (3) It is desirable that the children of lepers should be separated from their parents as soon as possible, and that they should remain under observation. (4) An examination should be made from time to time of those having lived with lepers by a doctor having special knowledge. It is desirable that lepers should not engage in certain trades or occupations. All leper vagabonds and beggars should be strictly isolated."

The fundamental principle of segregation underlies every effort at governmental administrative control of leprosy as a menace to the public health. But the principle of segregation goes much further in that it also recognizes the humanitarian considerations, which are practically absent in any other form of treatment or method of control. It is a lamentable fact that in the United States, including some of our larger cities, there is still an attitude of more or less pronounced antipathy toward segregation under humane and otherwise

reasonable conditions. There is, furthermore, a most serious indifference regarding the possibilities of leprosy spread through lepers permitted to go at large or treated privately under conditions which preclude the possibility of an effective protection of the community. The available evidence is absolutely convincing and entirely conclusive that wherever complete segregation has been practiced the disease has gradually diminished. This certainly has been the case in Norway since 1856 and in Hawaii during the last 20 years. The argument frequently advanced that the number of cases in this country is insufficient to warrant drastic measures is but further evidence of the public indifference to the true aspects of the leprosy problem. The disease is so loathsome, so tragic and so hopeless, that the menace of its needless spread to another single case from even the foci of one existing case is a risk which no civilized country can rightfully take. On the other hand the disease is so mildly contagious, and so difficult of transmission under proper hygienic conditions, that the inhuman treatment of exceptional lepers throughout the country is but evidence of our backward condition with regard to one of the most tragic disease problems of modern life.

Effective segregation is an expensive matter and the burden upon a single State may assume prohibitive proportions. An excellent illustration is the Massachusetts leper settlement at Penikese Island, under the medical administration of Dr. Frank H. Parker. The institution is administered by the State board of charities, and the plant is valued at $109,465. The normal capacity of the settlement is 19, or a per unit cost of nearly $6,000. The settlement provides hospital care and treatment exclusively for persons afflicted with leprosy. During the year 1913, 17 patients were under treatment, of an average age on admission of 38 years. Eleven were suffering from the disease in the tubercular form, 2 in the anæsthetic, and 2 in the mixed form. The proportion of females was only 4, or 23.5 per cent, out of the total of 17. A preponderance of male lepers has been observed in all countries for which trustworthy data are available. It is extremely significant that all of the patients on Penikese Island, with one exception, were of foreign birth or parentage, the races referred to being as follows: Chinese, 4; Portuguese, 4; Russians, 3; and 1 each from Japan, British West Indies, and Lettland. The expenditures for the year amounted to $23,390, of which $9,329 was expended for salaries, wages, and labor, and the remainder on account of maintenance, etc. The ratio of the daily average number of persons employed, to the daily average number of inmates, was 1 to 4.7.

The provision which is made for the segregation of lepers in the State of Massachusetts closely approaches the attainable ideal. It is in conformity to the efficient and humane methods of segregation at Molokai and the Louisiana leper home. Several additional institutions are required for other sections of the country. Until a person afflicted with leprosy has the positive assurance of adequate professional and humane care in suitable institutions under State or Federal control, the number of lepers at large is not likely to perceptibly diminish.

It would be extremely difficult, however, to determine with a reasonable approach to accuracy, the existing number of lepers throughout the continental United States. There are no reasons, however, why the fundamental principles of the leper law of Hawaii should not be incorporated at least in the regulations of all the more important State boards of health. Every leper is a serious menace to the community and his effective segregation is not only of great importance to the Nation, but of equal importance to the leper himself. The proper treatment of leprosy requires special facilities which can not be had even in well-equipped hospitals, to say nothing of the crude and often inhuman provisions made for isolated lepers in quarantine stations or pesthouses. There would, therefore, seem to be no alternative but to bring about the establishment of one or more national leprosariums under the direct administration and control of the Federal Public Health Service. The essential provisions of House bill 1751 are as follows:

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Treasury be, and he is hereby, authorized and directed to establish a national leprosarium in the United States or any of its insular possessions, the location thereof to be decided upon after proper investigation by the Surgeon General of the United States Public Health Service, subject to the approval of the Secretary of the Treasury. The Secretary of the Treasury shall have power to acquire, by condemnation or otherwise, a suitable site for the leprosarium and and shall erect

thereon all necessary buildings and thoroughly equip the same for the proper care and treatment of lepers confined therein and for the investigation and study of the disease of leprosy.

"SEC. 2. That the Surgeon General of the United States Public Health Service shall appoint all medical officers, assistants, surgeons, pharmacists, and other necessary employees, and shall promulgate and adopt, subject to the approval of the Secretary of the Treasury, all necessary rules and regulations to carry this act into effect.

"SEC. 3. That, under authority of this act, and State or Territory of the United States is authorized to transport all persons afflicted with leprosy found therein to the leprosarium, and the Surgeon General is directed to receive the same, such transportation charges to be paid by the United States."

This bill, and others like it, have been before Congress for several years but final action has been deferred. It is sincerely to be hoped that final action will be taken by the next Congress, but additional provision should be made for the gradual acquisition by the Federal Government of existing State leper settlements, so that ultimately all lepers may be segregated in suitable leprosariums under complete Federal administration and control.

If this plan should be ultimately carried through there would be an end to the existing intolerable situation. It would be utterly impossible to even briefly review the considerable number of lamentable cases of isolated lepers, which for the time attracted considerable attention but were soon forgotten, while the lepers themselves remained exposed to needless suffering and a menace to the community at large. Reference requires only to be made to the unwarranted action on the part of the New York City health authorities in releasing a number of lepers from a temporary settlement on North Brother Island, to mingle with the community without let or hindrance, upon the erroneous assumption that leprosy is not contagious or transmissible from person to person in northern latitudes. As a matter of fact, leprosy is endemic and has been endemic in Iceland for many years, and the Louisiana foci probably had its origin in the maritime Provinces, to which it originally may have been brought from Iceland or Norway. The number of lepers in Iceland at the present time is approximately 100. Only about two or three years ago the (then) commissioner of health of the city of New York was quoted in an interview in the Evening World, to the effect that "leprosy can not be contracted in this climate." At the same time a distinguished specialist was quoted to the effect that "In this region the presence of the disease is not a menace to the community"; and a physician attached to the Metropolitan Hospital on Blackwells Island, was quoted as having declared that "In this climate the fear of leprosy is unwarranted." As far as known, climate has absolutely nothing to do with leprosy, and the cases which have been observed in northern latitudes, including Minnesota, completely contradict the assumption that leprosy may not become endemic in this country, unless the known cases are immediately and permanently segregated under suitable conditions.

The case referred to is but a lamentable as well as sinister illustration of many. The disease is frequently given superficial medical consideration, as best shown in the well-known Early case, which was declared by a specialist in skin diseases, and attached to a well-known New York hospital, not to be leprosy, in opposition to the unanimous judgment of a committee of the New York Society for Medical Jurisprudence. At the present time, or about two years later, Early is one of two lepers segregated under far from satisfactory conditions in the District of Columbia. The specialist was fundamentally wrong, and the community was exposed to a most fearful risk because of a lack of serious consideration of a case in its early but cognizable state. In a matter of such enormous importance to the community it would seem that the public at large is entitled to the benefit of a doubt until every reasonable suspicion of leprosy in a suspected case has been removed.

Dr. HOFFMAN. Before I introduced my resolution, subsequently adopted by the American Academy of Medicine, I wanted to be sure that I had the sentiment of the country behind me. I therefore sent out my letter of inquiry, and I subsequently interviewed Dr. Dowling, State health officer of Louisiana; Dr. McLaughlin, State health officer of Massachusetts; Dr. Pratt, president of the Territorial Board of Health of Hawaii, and others, to ascertain their views.

The CHAIRMAN. You have a copy of your letter before you, have you not?

Dr. HOFFMAN. Yes, Senator.

The CHAIRMAN. To avoid any doubt about it, will you be good enough to put the letter into the record?

Dr. HOFFMAN. You mean one of the letters to the several State health authorities?

The CHAIRMAN. Yes, Doctor; just the form of the letter.

Senator WORKS. You mean the letter that the doctor wrote and sent out to the several States asking for information regarding the extent of leprosy in this country and the methods of segregation and care?

The CHAIRMAN. Yes; the letter the doctor wrote to these various health authorities asking, among other questions, whether they were in favor of a National leprosarium.

(The matter referred to is here printed in full as follows:)

JUNE 16, 1915.

SECRETARY STATE BOARD OF HEALTH.

DEAR SIR: I have agreed to read a paper on "Leprosy as a National Problem," before the American Academy of Medicine, at the meeting to be held in San Francisco during the week of June 20. Either in my address, or in a supplement thereto, since the time is rather short, I expect to present in brief outline the provisions at present made for the segregation and care of lepers in the principal States of this country. Will you be good enough to let me have, at your earliest convenience, a reply to the following questions, and return this letter in the inclosed stamped envelope?

1. What are the statutory provisions of your State or city for the segregation and detention of lepers?

2. Is leprosy a reportable disease in your State or city, either according to law or under the rules of your board?

3. What is the number of known lepers in your city or State at the present time?

4. What provision is made for lepers in your city or State, either according to law or under the regulations of your board?

5. If you have lepers under your supervision and control, please state their number and the institutional or other provisions made for their maintenance and care.

6. In your opinion, is segregation of all cases advisable?

7. Are you in favor of a national leprosarium to provide for the adequate treatment and care of at least such lepers as are apprehended by the authorities while in interstate transit, and which are probably the only cases which at the present time can be properly taken care of by the Government?

Should you find it convenient and possible to reply to any or all of the foregoing questions, you will please accept in advance my sincere thanks.

I remain,

Very truly, yours,

FREDERICK L. HOFFMAN, *Statistician.*

Dr. HOFFMAN. As said before, all of the replies to my letter of inquiry except one were emphatically in favor of a national leprosarium.

The CHAIRMAN. Have you any other points, Doctor, that you would like to bring to the attention of the committee?

Dr. HOFFMAN. I think not, Senator; but I desire to conclude with once more urging it upon your committee that you give favorable consideration to this important measure which concerns, it is true, but a relatively small number of people on the mainland of the United States, but at the same time an element peculiarly deserving of national consideration.

I trust that I have made it clear that in most cases adequate State care for lepers is entirely out of the question in isolated cases, and that the best possible results regarding the treatment and possible arrest of the disease are obtainable only at a properly maintained leprosarium. Furthermore, I hope that I have presented all the necessary statistical evidence in support of the conclusion that the only means of the gradual eradication of leprosy is through effective segregation, such as has now been for many years practiced in Hawaii, Norway, and in many other countries with excellent results. I have also tried to make clear to you the obvious interstate character of many of the cases of leprosy in this country, and the inequity of the placing of the financial burden for the care of such cases upon the few States making adequate and humane provision for the treatment of these unfortunates. In Hawaii during 1912, which may be considered a normal year, the sum of $232,000 was spent on account of 728 lepers, or $318 per capita; in other words, Hawaii spent more than $1 per capita per annum on account of leprosy alone. The expenditures at the Louisiana settlement amount to about $40,000 a year. In isolated cases, on account of the irrational and ill-advised methods prevailing at the present time, the expenses of maintenance and care often attain to needlessly considerable proportions. The establishment of a Federal leprosarium in a suitable location would provide the most effective means for the gradual checking of the disease, and last, but not least, for the more humane and proper care of the most afflicted element of the human race. Mr. Chairman, I should like to supplement my testimony by a letter which I shall address to you.

The CHAIRMAN. We will be glad to have you do so. We are certainly very much obliged to you for your testimony.

Senator WORKS. Yes; it has been very interesting.

(The letter referred to was subsequently submitted, and is here printed in full, as follows:)

THE PRUDENTIAL INSURANCE CO. OF AMERICA,
Newark, N. J., February 17, 1916.

Hon. JOSEPH E. RANSDELL,
Chairman Senate Committee on
Public Health and National Quarantine,
United States Senate, Washington, D. C.

MY DEAR SENATOR RANSDELL: In addition to my evidence before your committee, I desire to place on record my emphatic indorsement of the principle which underlies the Senate bill providing for a national leprosarium.

As emphasized in my resolution presented to the Thirteenth Annual Conference of State and Territorial Health Officers, I feel that the duty of the Government in this matter is so obvious as not to require elaboration, in view of the facts disclosed by my own investigations and as illustrated by the individual cases brought to the attention of your committee.

Since fairly adequate institutions are available in Massachusetts, Louisiana, and California, it would therefore seem that the proposed leprosarium should be located somewhere in the Central West. It would probably be advisable to appoint a special commission to locate a suitable site, with a due regard to such foci of infection as Chicago, where it is claimed many cases are at large.

My personal investigations at Molokai, at San Francisco, and in Louisiana have profoundly impressed upon me the duty of a persistent effort in behalf of these most unfortunate and absolutely helpless victims of a peculiarly loathsome and practically hopeless disease. No words of mine can give adequate expression to my own sorrow for these people, but in the light of my personal knowledge I can not but feel intensely the additional sorrow and suffering needlessly forced upon the helpless individual who suddenly and by no fault of his own finds himself the victim of leprosy in a State where he may be the only one of his

kind. I believe that the Nation owes it to itself and to the cause of a broader civilization that it shall leave nothing undone to provide liberally and humanely for these unfortunates who, under present conditions, are often most inhumanely treated.

I believe that the Nation should follow the remarkable example of broad-minded philanthropy and true humanitarianism illustrated by the adequate and intelligent care of lepers in Hawaii, in San Francisco, in Louisiana, and in Massachusetts. I desire to direct the attention of your committee to the fact that the Territory of Hawaii is under an annual burden of about $230,000, or a per capita expense of $1, on account of leprosy alone. Since the disease was introduced into Hawaii by Chinese immigrants during the early thirties or forties, it was there as with us an international problem in its inception, which was practically beyond the power of any Territory or State to effectively safeguard against. The most drastic quarantine measures could not possibly succeed in keeping out leprous immigrants in the very initial or noncognizable stage of the disease, when the leper himself would in all probability be entirely unaware of the impending calamity. The average duration of this disease is about eight years between the time of obvious lesions and death. How long there is a preceding period of development has not been determined, but certainly a number of years almost invariably elapses between the original contact infection and the first definite lesions which permit of a precise and conclusive diagnosis. It is therefore hopeless to anticipate the possibility of safeguarding the Nation against the introduction of leprous persons in the very initial stages of the disease from the many foci of infection in countries to the south of us or in the Orient, or even in Europe, with which we have close commercial and other relations.

I omitted to direct the attention of your committee to the fact that Gloucester fishermen frequently visit Iceland during the fishing season, and that Icelandic leper patients have on a number of occasions been admitted to the lazaretto at Tracadie, New Brunswick. Icelandic leper cases have also occurred in the Central Northwest and in Manitoba. Thus the more thoroughly the disease is studied the more complex becomes the problem of control through existing State agencies alone.

In the course of time I am absolutely certain the Nation will realize its complete duty and take over all of the existing leper settlements and care adequately and at national expense for all of these unfortunates whose support can not rightfully be charged against any particular locality as a burden to be provided for out of local revenues alone.

I believe that a public agitation of the question will do much to bring about a more enlightened public opinion, and will emphasize on the one hand the duty and on the other the humanity of adequate care but unconditional segregation. Recalling as I do with genuine sorrow the lamentable condition of the more than 1,000 lepers whom I have personally seen, and many of them more than once, I can not but strongly urge it upon your committee that you report favorably on the bill providing for a national leprosarium, so that our national conscience in this matter may be freed from the charge of inhumanity and indifference, not only toward the leper himself, but toward those unfortunates who are now exposed to the frightful risk of a fate which is but a living death.

I shall be pleased to be of any further service to your committee in connection with this matter, and I make use of this opportunity to express to yourself and to your committee my sincere appreciation of your courtesy and kindness at the hearing on February 15.

I remain,

Very truly, yours,

FREDERICK L. HOFFMAN.

The CHAIRMAN. I would like to have Dr. Fowler take the stand now and tell us about the Early case.

STATEMENT OF DR. WILLIAM C. FOWLER, CHIEF MEDICAL INSPECTOR, HEALTH DEPARTMENT, DISTRICT OF COLUMBIA.

The CHAIRMAN. Doctor, will you tell the committee about the case of John Early?

Dr. FOWLER. John Early first arrived in the District of Columbia in August, 1908. He was found in the Salvation Army headquarters

on Pennsylvania Avenue, just below the Capitol, near First Street. At the time of his arrival we had no provision here whatever for the care of a leper, and I removed him from the Salvation Army headquarters to reservation No. 13, which is a public reservation on which are located some of the public buildings belonging to the District of Columbia.

The first night he was kept in the ambulance, because I had no place to take him. A cot was arranged for him in the ambulance and he was cared for as well as possible under the circumstances. The next day a tent was purchased and erected on the reservation, where he was kept for some time, until we finally succeeded in obtaining the use of a brick building owned by the District of Columbia, on the same reservation. Early, according to his statements, had been a soldier in the United States Army and had seen service in Cuba and in the Philippines. He claims, and I think it is true, that he contracted his trouble in the Philippines. In the portion of the islands in which he was stationed we ascertained there had been a considerable number of cases of leprosy.

He stayed in Washington until July of the following year, when he went to New York with a Dr. Bulkley, who had offered to take him there and care for him in the Skin and Cancer Hospital in New York City. The laws of the District of Columbia make leprosy a reportable disease, and we are required under the law to isolate it. Early was isolated from the time he was first found in this District, and in order to keep him watchmen had to be employed, and we have had to continue the employment of these watchmen ever since. This is his third visit here. When he went to New York in 1909 it was with the understanding that he would not return to the District of Columbia. Notwithstanding that promise, however, he returned here in December of the same year and paid a visit to the matron at the smallpox hospital to let her know he had returned. I took Early in charge again during the afternoon of the same day and placed him in quarantine, under arrest, because the laws of the District make it unlawful for any person to come into the District while suffering from leprosy. He stayed here until the following December, when he was against taken to New York City, with the promise, again, that he would not return. We lost all track of Early until some time later on, when I read in the public press that he was in California.

The CHAIRMAN. Presumably he was traveling in public conveyances all the time?

Dr. FOWLER. Yes. When he went from Washington he went in a baggage car, which was chartered for his special use, and disinfected at the other end of the line. He finally found his way to Tacoma, Wash., and was later taken over by the Public Health Service at the Diamond Point Quarantine Station, where he was employed, I understand, as a nurse.

When he first came to Washington, D. C., he came here in an effort to have his pension increased and applied at the Pension Office, where he came in contact with a number of officials at that office, talked with employees, and mingled with other persons around the city. He also visited public dining rooms here. After being in the State of Washington for some months—I have forgotten just how long a time—I received a telephone message one morning asking if I wanted John Early. There was some little conversation over the phone, and

I was told that if I would go to a certain hotel, which is one of the most prominent in the District of Columbia, I would find John Early registered under a certain name. I did not know whether it was some one joking with me or not, but I went, however, to the hotel named, and on entering the room found John Early in consultation with several newspaper reporters of this city. I again took him in charge. That was, I think, on the 2d of June last, but I have forgotten the exact time, and I have had him here since.

Senator WORKS. What is his age now, about?

Dr. FOWLER. I should judge he is about 47 or 48.

Senator WORKS. Has he any family?

Dr. FOWLER. He had a wife and three children.

Senator WORKS. Do you know what became of his family?

Dr. FOWLER. Yes. When he came here first he had one child—a wife and child. While here on his first visit another child was born in the brick building of which I spoke. After he left Washington there was another child born somewhere in the West—I think, in California or in the State of Washington; I do not recall which. While in the State of Washington his wife applied for and secured a divorce, so he is to-day a divorced man. He is a United States pensioner; he gets a pension of $30 a month. He has been a considerable expense to the District of Columbia, because he is the only one we have here at this time.

The CHAIRMAN. About how much expense a year, Doctor?

Dr. FOWLER. We recently looked up the matter for the year 1915, and his expenses for that year were approximately $3,200 or $3,300.

The CHAIRMAN. Has there been any occurrence of the disease in his family—his wife or children?

Dr. FOWLER. So far as I know, there has not been. I do not know just where they are.

We had here a short time ago this man Grable who was referred to. He has wandered all over the country, according to his own statements. He was quarantined, he tells me, in Salt Lake City, San Francisco, New Orleans, St. Louis, and also here in Washington. He escaped one night some months ago from our place and went to Pittsburgh. He was then taken over by the Public Health Service, and I think, succeeded in eluding them and wandered back to Pittsburgh, and I recently read a letter from him to John Early, in which he stated that when he got back to Pittsburgh the people there felt so badly about his return, and he felt so sorry for them, he left and went to St. Louis, and that is where he is now—at Koch, near St. Louis, Mo. He seems to be able to wander around as he pleases, as has been the case with Early.

Senator WORKS. How do they get money with which to travel around?

Dr. FOWLER. Grable is an old railroad man, and I imagine he has some secret signs by which they help him along. As John Early was receiving money from the Public Health Service while in their employ, and $30 a month pension, I imagine he accumulated quite a little money. He told me he traveled in the best style in coming back from the State of Washington. He traveled all the way across Canada in a Pullman car, and when he arrived in Washington, D. C., stopped at one of the best hotels in this city.

The CHAIRMAN. He was there registered as a guest, and occupying a room in that hotel?

Dr. FOWLER. Yes; that is where I found him the last time.

Senator WORKS. What is the extent of the disease in his case?

Dr. FOWLER. He has quite a number of anæsthetic areas and quite a few nodules and some swelling of the limbs, but he is very much better now than he was some time ago. He seems to be very anxious for this national home, and he has spoken to me about it on several occasions. He alleges that is why he came back to this city, so as to agitate this question; and he stated to Senator Ransdell on Sunday that he was exceedingly anxious for this home, and would go there, and that he thought all the other lepers in this country would do the same.

Senator WORKS. Do you think it would be a good thing to have him come here and testify?

Dr. FOWLER. I would be glad to have him come here if the committee so desires.

The CHAIRMAN. What means have you taken to have him confined?

Dr. FOWLER. We have him in this brick building at the present time; the windows are barred, and the door is barred.

The CHAIRMAN. Barred with steel?

Dr. FOWLER. Yes. John Early, at the present time, is under arrest under the laws of the District of Columbia, for coming into said District while suffering from leprosy and without a permit so to do.

The CHAIRMAN. He is under arrest because he came here, being a leper?

Dr. FOWLER. Yes; and knowing it. The grounds surrounding the home are inclosed with a barbed-wire fence.

The CHAIRMAN. About how high?

Dr. FOWLER. About 8 feet in height.

The CHAIRMAN. With a projection over at the top?

Dr. FOWLER. Yes; sort of a T-shape top.

The CHAIRMAN. So it would be almost impossible for him to get out?

Dr. FOWLER. It would be quite difficult, I should say. On the first of this month we changed the plan of caring for him by employing a man and his daughter to stay there all the time, and we have done away with the expense of watchmen, and the expense it is believed will not be as great as it has been heretofore; but I want to say that it has not been more than a month—this is not known generally, however—that he did make a desperate attempt to escape; and he came near getting away.

Senator WORKS. You are now treating him practically as a wild animal?

Dr. FOWLER. Practically, I am afraid; we have to in order to keep him.

The CHAIRMAN. You have a comfortable room for him there?

Dr. FOWLER. Yes; as comfortable as we can make it.

Senator WORKS. I did not mean to reflect upon your treatment of him, Doctor.

The CHAIRMAN. Oh, no; I agree with you.

Dr. FOWLER. I think a national home would be an exceedingly beneficial thing. It would be a great protection to the public and a more humane way of caring for these unfortunate people.

The CHAIRMAN. His condition there was as sad as could be. He used the expression that his condition was as bad almost as being in hell. You remember, Doctor, he used that expression?

Dr. FOWLER. Yes.

Senator WORKS. Do you know anything about the degree of suffering that results from the disease?

Dr. FOWLER. I have only had three cases here. All of them were contracted in the Philippine Islands. One was a Filipino, brought here by a naval officer, and he was deported; the other case was Grable. John Early has at times suffered considerably from neuralgic pains, and it has been necessary to administer drugs to relieve him, but, generally speaking, he suffers very little. There have been times, however, when he has suffered considerably.

The CHAIRMAN. He had a fairly healthy look about his face.

Dr. FOWLER. He is looking very much better now than he was a month ago.

The CHAIRMAN. Doctor, would you be willing to take Senator Works, or any other members of the committee who desire to see Early, down to see him some day?

Dr. FOWLER. I will be glad to do so any time.

Senator WORKS. I think I would be perfectly willing to take the Doctor's statement about it. I would not have any fear, Doctor, but those things are not pleasant to look upon. Where it is necessary, I am perfectly willing to do anything of that sort, if anything may be gained by it, however.

Dr. FOWLER. I would like very much to take the committee down and show them the home and the surroundings, which are the best we can do for him.

Senator WORKS. I would be glad to see it.

The CHAIRMAN. They seemed to be the best you could do under the circumstances, but it is a sad thing. Thank you very much, Doctor, for your testimony.

We will now hear Mrs. Crafts.

STATEMENT OF MRS. WILBUR F. CRAFTS, OF WASHINGTON, D. C.

Mrs. CRAFTS. If I might, I would just like to revert to the subject that was under discussion a few moments ago.

The CHAIRMAN. Treat it in your own way, Madam.

Mrs. CRAFTS. About whether or not the lepers should have permission to go or not to go to the leprosarium, if it be established. I want to say that a very few years ago I was in Jerusalem, the Holy City, and I was told that there is a leper home there for those who wish to go there, but they are not obliged to stay in the home. I took an early morning walk down the Mount of Olives, into the Garden of Gethsemane, and then around the city of Jerusalem, and on my way I saw a mile of lepers—about between 200 and 300 lepers—on both sides of the common road down the hill and into Jerusalem—the most miserable looking people that I ever saw in my life, and the most terrible cries coming from their throats that I

ever heard. I saw little babies crawling in the dust of the road; they were not lepers, but they had leper parents there. I never saw human beings in such a terrible condition as those lepers; and, worst of all, I saw a Turkish officer come and collect taxes from those lepers on gifts that travelers had given them as they sat there. They did not choose to live in the home that had been provided for them; they were not forced to live there; and they preferred to sit out on the roadside and beg.

The CHAIRMAN. And they live by begging?

Mrs. CRAFTS. Yes; they live by begging. So, it would seem to me, if we have a leprosarium, the lepers ought to be obliged to live in it.

The CHAIRMAN. That they should be compelled, by law, to go there?

Mrs. CRAFTS. Yes; it would make it safer for other people.

The CHAIRMAN. And better for them?

Mrs. CRAFTS. Yes; and better for them.

I went to Iceland about five years ago to study sociological conditions. There is a leper hospital in Iceland which is much finer than the Parliament House. It is an up-to-date hospital, and in it are gathered 100 lepers, all of the lepers in Iceland.

An invitation was sent to me by some lepers in the leper hospital to come and visit them, and so I walked over to the leper hospital. I expressed my surprise at there being leprosy in Iceland, and I was told that it was largely on account of their diet. There are no vegetables grown in Iceland, only just a very few potatoes, and their diet is mostly fish, and, while in season fish are very delicious in Iceland, when they are preserved they are not very nice, and they eat them all—heads and tails and everything else about the fish—and they are carried on little ponies, and emit a very foul odor as they pass along the roadway; and I was told that the leprosy was very largely on account of the decayed fish which the people eat. At the leprosarium I talked with the lepers for about half an hour, and had a most interesting conversation with them, all in Esperanto. I could not speak a word of Norsk, nor could they speak a word of English. They told me "Esperanto gives us a very pleasant occupation here in the hospital, and it makes us feel that we still have a hold on the world."

They could talk to anybody from any part of the world who could speak Esperanto.

The CHAIRMAN. Do many of the lepers speak Esperanto?

Mrs. CRAFTS. About eight talked with me. Those were all who came out for the interview. This interview was afterwards published in the Esperanto magazines throughout the world, and there was one gentleman, a physician in London, who said "If he were not already an Esperantist that incident alone would make him one."

The CHAIRMAN. Did these lepers seem to be well cared for?

Mrs. CRAFTS. Beautifully cared for. As I said, their building was more handsome than the Parliament House, and I may say the funds for it were all furnished by the Good Templars of Iceland, and it is sustained and carried on by the Good Templars in connection with the national government, so in one sense it is a national leprosarium; and the great contrast between those lepers and the lepers I saw in Jerusalem makes me feel that when there is a leprosarium all of the lepers should be obliged to live in it.

The CHAIRMAN. How have you felt toward a measure of this kind, Mrs. Crafts?

Mrs. CRAFTS. I am very much in favor of it, and I hope that the measure will prevail, and that we shall have a National leprosarium in the United States.

The CHAIRMAN. We are very much obliged to you, Mrs. Crafts.

We will take a recess now until 2.30 to-morrow, at the Commerce Committee room of the Senate, in the Capitol.

(Whereupon, at 5.15 o'clock p. m., the committee adjourned until to-morrow at 2.30 o'clock p. m., Wednesday, February 16, 1916, to meet in the room of the Committee on Commerce in the Capitol Building.)

CARE AND TREATMENT OF PERSONS AFFLICTED WITH LEPROSY.

WEDNESDAY, FEBRUARY 16, 1916.

UNITED STATES SENATE,
COMMITTEE ON PUBLIC HEALTH AND
NATIONAL QUARANTINE,
Washington, D. C.

The committee met in the room of the Committee on Commerce, Capitol Building, at 2.30 o'clock p. m., pursuant to adjournment, Senator Joseph E. Ransdell presiding.

Present: Senators Ransdell (chairman), Fletcher, and Works.

The committee resumed the consideration of the bill (S. 4086) to provide for the care and treatment of persons afflicted with leprosy and to prevent the spread of leprosy in the United States.

The CHAIRMAN. Dr. Woodward, we will hear from you first. Tell us what you think of the bill we have here under consideration.

Dr. WOODWARD. Very well.

STATEMENT OF DR. W. C. WOODWARD, HEALTH OFFICER OF THE DISTRICT OF COLUMBIA.

The CHAIRMAN. If you have any facts in regard to this proposed legislation, I would be glad to have you state them to the committee. I will say, before you begin, that, in regard to Mr. Early, who is immediately under your charge, your subordinate, Dr. Fowler, gave us pretty full information as to the facts in his case.

Dr. WOODWARD. We have had in the District of Columbia, as you may know, two other cases.

The CHAIRMAN. He spoke of Grable.

Dr. WOODWARD. Grable is one. He, like Early, contracted the disease in the Philippines, according to his history. The other patient was a Filipino, who was brought here in the family of a naval officer.

The leprosy problem of the District of Columbia has been essentially of Federal origin, inasmuch as all the patients came from the Philippines in connection with Federal services. They might rightly feel, therefore, that they have a special claim for Federal protection.

Senator WORKS. Besides, these cases are here in the District of Columbia, where the National Government has exclusive jurisdiction. That would make a difference also.

Dr. WOODWARD. Certainly. My contact with these lepers and the occasions that I have had to look into the subject of the establishment of a Federal leprosarium have shown me some of the possible difficulties in the way of operating such an institution, which ought

to be cleared up, it seems to me, or at least fully anticipated and provided against, before the project is embarked upon. We seem to be proceeding here upon the presumption that all the lepers in the United States, or many of them, will be desirous of going into a Federal institution. I am not so sure that that is the case. We found, for instance, that our Filipino patient and Mr. Early were rather choice as to where they would go and where they would not go; and I am sure that the same question will arise with respect to anyone who develops leprosy in any part of the United States when it is proposed to carry him to some more or less remote point, where his family can not see him and where he can not see his family.

Senator WORKS. That is a matter that was remarked upon the first day of the hearing. I think it was one of the witnesses from your State, Mr. Chairman.

The CHAIRMAN. Yes, Dr. Dyer.

Senator WORKS. The question arose as to whether they would consent to go long distances away from their homes in order to enter a national leprosarium.

Dr. WOODWARD. The sanatorium in Louisiana is not a very long distance away from the homes of the lepers in that State, of course. It is so near New Orleans that you can leave New Orleans for the sanatorium in the morning and be back home that evening; but if the proposition be to transport a man half way across the continent, or all the way across the continent, the situation will assume a very different aspect.

The CHAIRMAN. That home is only about 30 miles from the State capital. As you say, it is easily reached from New Orleans, as it is so close to that city that one may leave New Orleans and go to the colony and return back home the same evening.

Dr. WOODWARD. The patient does not abandon his family, and his family does not abandon him, when he goes to that institution, such a short distance away. I think that is a very important factor.

I have not been able to satisfy myself that it will be possible to take a leper from a given jurisdiction and, either under Federal law or under State law, convey him from his home to some remote point outside of that jurisdiction.

The CHAIRMAN. There is no question about the right to take him to a home which is within the jurisdiction of the State, is there, Doctor?

Dr. WOODWARD. That I would prefer not to express an opinion upon, without further inquiry. If it can be shown that the removal is reasonably necessary in order to protect the public health, beyond question he can be taken away; but if within the limits of his own home isolation be practicable, I think we may find that he is entitled to stay in his own home. The Government can, of course, impose on any citizen any needful regulation for the protection of the public health; and if a man violates that regulation, the Government can, of course, punish him.

The CHAIRMAN. If he were a man of sufficient means to carry out in his own home the regulations which the public health authorities thought to be sufficient to fully protect the public, you would question the right to forcibly remove him from his home?

Dr. WOODWARD. Very much.

The CHAIRMAN. But if he happened to be a poor man who did not have the means to take those precautions, and the public would per-

haps thereby be in danger, then they would have the right to take him away?

Dr. WOODWARD. In its own defense; yes. It could not be done simply by reason of his poverty.

Senator WORKS. You could not make any distinctions between classes and individuals, could you?

Dr. WOODWARD. No. You would have to place it upon the inability of the poorer man to comply with the regulations. If the poorer man was able to comply with the regulations, as well as the man of better circumstances, they would both be on the same footing.

Senator WORKS. The courts have gone a long ways in upholding the police regulations for the protection of the public health, even to the extent of destroying property in many cases; and I am inclined to believe that the Government would have the power to go to the extent of compelling a person of that kind, if his presence endangers the public health, to go somewhere where the public would be protected from the menace.

Dr. WOODWARD. I agree with you entirely; but whether a leper living under reasonable conditions constitutes such a menace to public health is quite a different problem. A statute providing for such removals might, of course, be regarded as such a legislative determination of the necessity for such action as the courts would not review.

Senator WORKS. That is a question of fact which might come in, of course.

Dr. WOODWARD. I do not believe we could show the unconditional necessity for the segregation of every leper, no matter how he may be situated.

Senator WORKS. That might be.

Senator FLETCHER. You do not believe that it is sufficiently established that the disease is so contagious that it might be communicated or is infectious?

Dr. WOODWARD. It is not readily communicable. It is not so communicable as ordinary pulmonary tuberculosis. So if we should reason that we may take a leper, regardless of his circumstances, and transport him to some public institution, we may reason equally well that the same course will be sanctioned in the case of a person suffering from tuberculosis.

Senator FLETCHER. That might be so.

Dr. WOODWARD. In order to get definite knowledge of the prospect of filling the proposed leprosarium inquiry might be directed to persons most directly affected—that is, the known lepers in the country. How many of those who are now registered as leper patients would go to a Federal leprosarium and under what conditions? That question might be answered by such a procedure.

The CHAIRMAN. How would you consider this practicable when the health authorities have testified that they could not find more than about 146 in the whole of the United States, although they are satisfied that there are a great many more, and some go to the extent of saying that there are from 800 to 1,200, and others that there are three times that many in the United States?

Dr. WOODWARD. A poll of those registered lepers would afford an index probably to the entire leper population.

The CHAIRMAN. Most of those that you know about are in leper homes, in Louisiana, in San Francisco, or rather in California, and in Massachusetts. They are probably pretty well provided for. They are already in good homes.

Dr. WOODWARD. Yes.

The CHAIRMAN. You think that what they would say about it would be an index as to the lepers generally? Take those in Louisiana, for instance. They probably would not want to leave there and go to a national home.

Dr. WOODWARD. What they would say would afford, I think, an index, so far as that class is concerned—that is, persons who are accommodated in that way. On the other hand, we have, notably in Minnesota, a reasonable number of lepers who are not accommodated in that way, and are scattered here and there throughout the country. It is the occasional leper, who is not taken care of by an institution, who needs a leprosarium, such as is contemplated by this bill. There is one here in Washington; there is one in Richmond, Va.; there are some in Missouri. They are scattered throughout the United States. There are some in Texas and some in California. The California institution is in San Francisco and is a San Francisco institution and not a State institution. Elsewhere in the State lepers are in the county poorhouses.

We would get by this sort of inquiry an index to what might be expected of all of those lepers. If we can not find 600 or more lepers under the present circumstances, the question arises whether we would be any better able to discover them if we had an institution for their care. I do not think we would.

The CHAIRMAN. You did not hear the testimony of Dr. Engman yesterday, did you?

Dr. WOODWARD. Yes, sir; I did.

The CHAIRMAN. You don't agree with him that the doctors would be more willing to give the facts of a case if there was a comfortable place to put them? He said that the doctors would make it known when there were leper cases if there was such an institution to put them in. He said after his harrowing experience in connection with a man he mentioned—I forget his name——

Dr. WOODWARD (interposing). Mr. Hartmann.

The CHAIRMAN. Yes; he said that after that experience the doctors there would not report another case of a leper if one was discovered. They would not subject them to the barbarous treatment of the one he told about.

Dr. WOODWARD. I think the result might be the same even if there were a Federal leprosarium. Realizing that to report a case meant not this isolation by public sentiment, but transportation to some place remote, it might be, from family and friends, the physician would be even less willing to make report. I am not sure about that. That is speculation, of course.

The CHAIRMAN. I am not sure either.

Dr. WOODWARD. There is another complicating element—the attitude of such States as New York, where a leper is at liberty to go and come absolutely at will. Lepers have there their own haven of refuge as long as they will go there.

The CHAIRMAN. By haven of refuge you mean the entire Commonwealth of New York?

Dr. WOODWARD. The entire Commonwealth of New York; yes, sir.

The CHAIRMAN. You do not mean a home for them?

Dr. WOODWARD. No.

Senator FLETCHER. They do not restrain them at all?

Dr. WOODWARD. Not in the least.

Senator FLETCHER. Is not that rather dangerous? Is not the leper a real menace?

Dr. WOODWARD. That is the opinion, I believe, of the vast majority of physicians. New York State has been influenced, however, by the opinions of men there who are men of standing and ability and whose influence has led to the present attitude; and so long as that opinion prevails in one State or in two or more States, of course no State is protected. Take, for example, our patient Early. When we first had John Early, he went to New York State with the consent of the New York State authorities and the United States Public Health Service. He stayed there as long as he felt willing and then departed for parts unknown, turning up in the State of Washington.

Senator WORKS. I do not understand how any such mutual consent as that can be given, especially by the Public Health Service.

Dr. WOODWARD. Their consent is merely to transport across State lines.

Senator WORKS. That is consent that he might be turned loose on the community, is it not, Doctor?

Dr. WOODWARD. Theoretically it was not, because having gotten into the State of New York it was then against the interstate quarantine regulations for him to cross the State line to another jurisdiction.

Senator WORKS. The result of that was to turn him loose in a State where he was at perfect liberty to go where he pleased, was it not?

Dr. WOODWARD. I see the point, Senator. The State was willing to receive him and his friends were willing for him to go.

Senator WORKS. That would hardly justify you in turning him loose.

Dr. WOODWARD. That was merely turning him over to New York. Our permit was merely for him to cross State lines.

Senator FLETCHER. How about the case of the Filipino?

Dr. WOODWARD. Early was first allowed to go to New York State, with the consent of New York State authorities and the Public Health Service, and he was to remain there. He later turned up in Washington again, but was arrested, and again, on account of our inability to get him before the courts, he was allowed to return to New York State, where he remained for a while. He later left there and then traveled over the country, finally turning up in the State of Washington. He subsequently left there, traveled over the country again, and turned up here in one of our fashionable hotels, telephoning us that he was there. I suppose he did that because his money had run out and he did not have any place to go. He is now with us.

Senator FLETCHER. Who is taking care of him?

Dr. WOODWARD. The District of Columbia.

Senator FLETCHER. At its own expense?

Dr. WOODWARD. Yes.

The CHAIRMAN. It costs $3,200 a year, as one of the physicians under Dr. Woodward testified.

Dr. WOODWARD. The patient Grable escaped from us and is now in St. Louis, Mo. The Filipino we finally got back to the Philippine Islands. We arranged, through the courtesy of the Bureau of Insular Affairs of the War Department, to have him returned to the Philippines, on condition that we delivered him on board the transport at Seattle. It was a supply transport, and we were to build a cabin on the boat, which he might occupy on his journey across the Pacific, and which was then, on his arrival, to be destroyed.

The CHAIRMAN. Do you remember what it cost to get him over?

Dr. WOODWARD. We chartered a baggage car and put into it all necessary articles to take care of him, food, etc., and means for taking care of his excreta. We sent him, with one of our men from the health department, across the continent to Seattle, and delivered him on board the transport.

Senator FLETCHER. Don't they claim to have discovered a remedy for leprosy in the Philippines?

Dr. WOODWARD. They claim to have discovered a new and more effective application of an old remedy; that is, chaulmoogra oil. The most conspicuous difference in the present treatment is that the oil is hypodermically used. We tried it with Grable, but he said the treatment was too painful; that if we could give him any assurance of a cure he would be willing to submit to the treatment; but he objected to submitting to this painful treatment if it was going only to prolong the days of his disability and disfigurement. He declined to take the remedy.

The CHAIRMAN. Dr. Dyer spoke of 30 cases which he considered had been cured, and some others spoke of cases that had been very considerably mitigated, not cured, and which they did not know whether could be cured or not.

Senator WORKS. Is that man Grable getting better?

Dr. WOODWARD. He is on the down grade now. In the early days, his symptoms would disappear and he would feel that he was getting well, and those unfamiliar with the disease apparently felt that he was well, but he then had a relapse. Now, he is in pretty bad shape.

Senator WORKS. Would his physical appearance indicate that?

Dr. WOODWARD. Oh, clearly. The gross features generally, enlarged hands and feet, all indicate that.

Senator WORKS. There is no longer any doubt about his having it?

Dr. WOODWARD. We never did have any doubt.

Senator WORKS. I suggest, in view of what the doctor says, that it might be well to ask the Department of Justice to give us an opinion as to the power of the Government to compel the transportation of these people and their confinement in a sanatorium.

The CHAIRMAN. I think it would be advisable to have that; yes.

Senator WORKS. If I had time to do anything toward it myself, I would be glad to get it up.

The CHAIRMAN. Do you think we ought to have it in this hearing?

Senator WORKS. I think we ought to have it; yes.

The CHAIRMAN. Don't you think it would be time enough if we had it when we take up the bill and consider it? This is only the hearing of the bill, and I would like to have it concluded to-day, if possible.

Senator WORKS. Oh, I do not mean to stop the hearing to get it. but I think we ought to have it.

The CHAIRMAN. I think it is a good idea.

Senator WORKS. We have this situation, that a large proportion of the known lepers are provided for now. The people in your State are amply provided for?

The CHAIRMAN. Very adequately; yes.

Senator WORKS. They probably could not have any better treatment under the Government?

The CHAIRMAN. I do not think they could.

Senator WORKS. So it has been testified that the people in California are receiving good treatment, and those in Massachusetts also. There are really most of the known lepers in those States. They would have very few more known lepers.

The CHAIRMAN. Dr. Dyer testified very positively that there were others.

Senator WORKS. Take the case in Louisiana. If I remember rightly, the doctor said that there were quite a number that were not willing to go to the home. There is a place where you could test the question.

The CHAIRMAN. If they are not willing, the courts send them. Dr. Dyer said it was a case of putting them on trial just as in lunacy.

Senator FLETCHER. And the judiciary determines whether they shall go or not?

Senator WORKS. I don't remember of his saying that.

The CHAIRMAN. He said that 20 per cent of the cases in Louisiana were sent to the home by compulsion of the court.

Senator WORKS. I understood that 20 per cent were not willing to go.

The CHAIRMAN. I think I asked him specifically about that, and he said that 80 per cent were willing to go, and that 20 per cent were sent there by compulsion.

Senator FLETCHER. How does Missouri deal with the question?

Dr. WOODWARD. I don't know.

The CHAIRMAN. Dr. Engman testified rather fully on that yesterday.

Dr. WOODWARD. They have some sort of an establishment outside of St. Louis to which these cases are sent. Dr. Engman referred to that in connection with the man Hartmann, and referred to the fact that they had a Chinaman there. They also at one time had our friend Grable there.

The CHAIRMAN. It was attached to a pesthouse, as I remember the testimony.

Dr. WOODWARD. The same is true of Pittsburgh, where Grable went when he left Washington. They were in distress because they had had a leper there, but he had died shortly before Grable arrived, and they had destroyed the building. When Grable arrived there they were without a place to put him.

I would like the record very clearly to show that I am in hearty and thorough sympathy with the establishment of a leprosarium if we can make it accomplish its purpose; but I would not want to see a fiasco made of the movement by getting an institution and then not being able to accomplish the purposes for which it was established. I think a thorough inquiry should be made along these lines which I have suggested before any appropriation is made or anything done.

I think any appropriation should be safeguarded so that the proposed purposes may be accomplished.

The CHAIRMAN. I think that is very wise.

Senator WORKS. I think you are quite right about that, Doctor.

Senator FLETCHER. This man Early has a family, hasn't he?

Dr. WOODWARD. Yes; he has had.

Senator WORKS. That was explained before, that he had a wife, and had had one child before he was afflicted, and then had two afterwards.

The CHAIRMAN. Doctor, I am requested by Mr. Trundle, a resident of this city, to ask you these questions.

Dr. WOODWARD. Very well.

The CHAIRMAN. The first question is, Is it not a fact that provision would have to be made in this bill or elsewhere to transport affected persons from one State to another, even though the person under consideration was himself willing to be so transferred? I think you have already covered that.

Dr. WOODWARD. I think so, yes. The only provision that I can conceive of is money to pay his expense of transportation.

The CHAIRMAN. Yes.

Senator WORKS. It might be necessary, Doctor, to protect others traveling from contamination. There perhaps ought to be a separate car, as in the case of the man you transported to Seattle, in sending him to the Philippines.

Dr. WOODWARD. It is only a question of money to provide attendants and conveyance.

Senator WORKS. Yes; it is only a question of money, I should think.

The CHAIRMAN. The next question is, Does not Mr. Early claim that his present condition of health is due largely to confinement in an unhealthy locality?

Dr. WOODWARD. Not so far as it relates to leprosy. Mr. Early has been acutely ill with what was probably a malarial infection, although we are not prepared to say that. He might have claimed that something of that sort was due to his confinement in the house where he now is.

The CHAIRMAN. No. 3 is, Is not Mr. Early being held now in violation of the Constitution, not because he is held as a leper, but because there are charges here pending against him and he has no opportunity of having these charges decided?

Dr. WOODWARD. I should say that Mr. Early is being held now in two ways. One is by virtue of a warrant for his arrest, issued by the police court, for violating the laws relating to leprosy in the District of Columbia, inasmuch as, knowing that he was a leper, he deliberately came back here and moved from place to place and exposed others; for that a warrant was procured against him. The case has not been brought to trial, and perhaps the police court is not particularly anxious to take up the case.

Senator WORKS. Probably not.

Dr. WOODWARD. He has been notified that so far as the health department was concerned he could get a trial, and we have written to the corporation counsel with respect to the matter; but the corporation counsel has not proceeded. Aside from that, as a leper, in the District of Columbia he is subject to exactly the same restric-

tions as he would be if he were suffering from smallpox. The same law is applicable alike to anyone who suffers from either disease.

Senator WORKS. If he was tried under the other charge, he would not be released from it?

Dr. WOODWARD. He might be locked up in his present quarters and be fined as much as $200, but that is all.

Senator WORKS. He would still be subject to confinement?

Dr. WOODWARD. He would still be subject to confinement because he is a leper, and the law specifically authorizes the court to designate any safe place in which to confine a person suffering from leprosy.

Senator WORKS. Do you think there is any ground for the claim, if it be a claim, that he is being kept in insanitary conditions?

Dr. WOODWARD. I think not; further than it relates to the proximity of the place where he is confined to the swamp area, which is perhaps not an ideal place, because it is on the borders of the Anacostia River. The same thing applied for years to the District workhouse and poorhouse, and it applies now as to the jail, the Washington Asylum Hospital, the smallpox hospital, and the quarantine station.

Senator WORKS. I do not think that comparison would be very creditable to the place where he is confined.

Dr. WOODWARD. No; but the Government is proceeding as rapidly as possible to abate the nuisance.

The CHAIRMAN. I have a letter from John Early, directed to me, dated Washington, February 14, 1916. It purports to come from John Early. Do you know that it came from John Early, Doctor?

Dr. WOODWARD. It came from John Early; yes.

The CHAIRMAN. It reads as follows [reading]:

Senator RANSDELL,
Washington, D. C.

DEAR SENATOR: Sunday you asked the question is there enough lepers in the United States to justify a national leprosarium, to the which I will answer through the following facts: There are about 500 known cases in the United States that have developed mostly within the past 10 or 15 years. Three of them I have knowledge of personally and was soldiers in the Philippines, and as far as the facts show the disease was contracted there. Therefore, we can readily see that leprosy is spreading in the country to an extent that calls forth sharp local attention and certainly should call forth national. To segregate a leprous person is wise and humane thing to do, but to let matters to drift on in the present road is another thing. As soon as a leper is found, under present conditions, he finds himself out of a home and absolutely unwelcome in the jurisdiction where he is found. I know of cases where the law has been violated by one jurisdiction shifting a leper into another. Such would cease under national supervision. There is a tendency on the other hand, under existing status, for the local doctor to refrain from reporting cases which would also cease under national care. Leprosy is surely a dread disease, not only in name, but in facts, gnawing away the vitals of the system, in time reduces the strongest to apathy and helplessness. Truly he is a hard sufferer when all conditions are considered. Then, we ought, as a Christian Nation, make provision for him. Remember we are outcasts of society; yes, with human tastes and feelings.

Yours, very truly,

JOHN EARLY.

P. S.—Please pardon mistakes. I had to write in haste.

Senator WORKS. That is a very good letter.

Senator FLETCHER. Yes.

The CHAIRMAN. Doctor, we are very much obliged to you. I will ask Dr. McCoy to address the committee.

STATEMENT OF DR. GEORGE W. McCOY, SURGEON, UNITED STATES PUBLIC HEALTH SERVICE, DIRECTOR OF HYGIENIC LABORATORY.

The CHAIRMAN. You say you have recently been the director of the United States leprosy station in Hawaii?

Dr. McCOY. Yes, sir; director of the United States leprosy investigation station in Hawaii.

The CHAIRMAN. You were there last, when?

Dr. McCOY. I left there about three months ago.

The CHAIRMAN. Did you spend much time in your investigation of the disease?

Dr. McCOY. I spent about four years studying leprosy in Hawaii.

The CHAIRMAN. Did you live there for four years?

Dr. McCOY. Yes, sir.

The CHAIRMAN. Studying leprosy?

Dr. McCOY. Yes, sir.

The CHAIRMAN. You think you have investigated the disease as thoroughly as you could possibly do so in that length of time?

Dr. McCOY. I tried not to waste any time.

The CHAIRMAN. Naturally.

Senator FLETCHER. How many cases did you have there, Doctor?

Dr. McCOY. We have about 650 to 700 known lepers. When I left there were, as I recollect, about 680. Most of them were in the Molokai settlement.

Senator WORKS. Is there a compulsory law there?

Dr. McCOY. A very rigid law, which the Territorial courts have sustained.

The CHAIRMAN. Give us an idea of that law, Doctor?

Dr. McCOY. The law, in general, provides that when any person is suspected, either by himself or by another person, of being a leper he may call upon the board of health to give him an official examination by not less than three physicians. If they agree on the diagnosis he is immediately officially committed by the board of health to the leprosy station and remains there until released by the board of health or until the case terminates. If the individual does not see fit to present himself voluntarily, the law provides that a court may issue a warrant for his arrest, and he may be brought before a court, which will order an examination by three physicians.

In the four years in which I was intimately connected with the commitment of lepers there was not a single instance in which the issuance of a warrant was required. Practically every leper came forward voluntarily or upon request when information was given by a physician or by some other person.

The CHAIRMAN. Why did they come forward voluntarily?

Dr. McCOY. I think perhaps the chief reason was that they knew they would be compelled to come by the board of health by operation of the law.

Senator WORKS. So far as the court proceeding is concerned, it seems very much the same as proceedings relating to the insane.

ANAESTHETIC LEPROSY, TYPICAL CASE.

Note the patches in which the patient has lost sense of feeling.

Dr. McCoy. I judge so. I am not acquainted with that. I think it is only fair to say that there are some cases in which the individual is undoubtedly actuated by a feeling that to come forward voluntarily is a duty which he owes to the community in order that it may be determined whether he is a leper or not.

The Chairman. They are treated kindly and comfortably, are they, there, Doctor?

Dr. McCoy. Very. The Territory of Hawaii has done itself proud in the care and treatment of lepers, and there are very few people who realize what a tremendous social and financial burden it has been to the Territory. The cost is about $200,000 a year.

The Chairman. You say the treatment is very humane?

Dr. McCoy. Very humane, yes. There is nothing that, humanly speaking, could be provided for them that is lacking.

Senator Fletcher. These cases all originated there, did they not?

Dr. McCoy. Practically all of them originated there, yes. Hawaii is one of the world-famous foci of lepers.

The Chairman. It has only existed there since 1838, I think.

Dr. McCoy. The dates are somewhat conflicting on that. The first recognized leper, one recognized beyond any reasonable question, was about the year 1849.

The Chairman. Dr. Blue, of your service, said, several years ago, that the first known cases were in 1838.

Dr. McCoy. There is a lot of conflicting opinion in regard to when it started and as to where it came from. But I think it has become the consensus of opinion that it was brought in by the Chinese. Probably they carried it into Cuba and into some of the Pacific islands other than Hawaii. In California the cases are very largely of Chinese origin, too.

Senator Fletcher. Have you satisfied yourself as to the causes of leprosy, whether they are traceable to diet or what?

Dr. McCoy. The way leprosy is carried from one person to another is a matter about which no one knows anything with certainty, practically speaking. We do know that it is a contagious disease, but we do not know how it is carried. There is no evidence that diet has anything to do with it.

Leprosy first attracted serious attention in 1864 in Hawaii, and a settlement was established in that year and has been in operation ever since—a little over a half century.

Senator Works. What was the occasion for that? Did it appear in epidemic form?

Dr. McCoy. It appeared to spread rapidly among the natives. The spread of the disease in Hawaii has been very largely among the natives. Comparatively few people of other nationalities have developed it. Outside of those of native blood the largest number afflicted is among the Portuguese.

Senator Fletcher. What observation have you made in regard to the duration of the disease?

Dr. McCoy. You mean how long the individual usually lives?

Senator Fletcher. Yes, sir.

Dr. McCoy. That varies. The shortest period I have seen is about three years. Some cases last as long as 30 years or even longer. There are lepers at Molokai who have been there not far from 30 years. The average is about 10 years.

Senator FLETCHER. Do any of those who put into this station ever come out?

Dr. McCOY. Oh, yes. I served on nearly all of the examining boards while I was in Hawaii, and we released nearly 40 people in the four years I was there. It is a comparatively small proportion of those in the settlement.

Senator FLETCHER. Have you any instances where it subsequently developed and they conveyed it in any way?

Dr. McCOY. There is no instance of where they are known to have conveyed it. There have been very few instances—only one, I believe, in my experience—where the disease reappeared. All those released as "cures" would remain somewhat under suspicion. We would not feel entirely safe about a person who once had leprosy, because it is a disease that is prone to recession and aggravation. However, extremely few have ever come back again after being released.

Senator WORKS. I suppose they are submitted to a certain examination upon being released?

Dr. McCOY. Yes, sir; the board of health has regulations which require those who are released to report not less frequently than once in six months for further examination; so the community is very well protected in that respect. A board of three physicians examines him. If a leper wants to waive his right to a full board of three physicians for admission to the hospital, he may do so; that happens sometimes; but a person must be examined by three physicians when he is released.

The CHAIRMAN. Will you describe the disease as to the cause, the symptoms, etc.? Tell us something about the disease. That is a question that has not been gone into by any of the witnesses.

Dr. McCOY. All right; if I draw it out too long, choke me off.

The CHAIRMAN. I do not think you can make it too long. We want it rather fully.

Dr. McCOY. There are many interesting facts in connection with leprosy. In the first place, there are only a limited number of people in any community who are infectable—that is, who could possibly get leprosy. The experience in Hawaii shows rather clearly that even under conditions of most intimate association—where a man is living with his wife, for instance—not to exceed 5 per cent of the people will be infected. In the ordinary run of the native population in the Hawaiian Islands, it seems that about 2 per cent will acquire leprosy. That is not a very high figure for a contagious disease, but still that is the fact. In New Caledonia, a French possession in the South Seas, at one time almost 5 per cent of the population had leprosy.

The CHAIRMAN. You say there are, perhaps, 5 per cent of the people of New Caledonia afflicted?

Dr. McCOY. Yes; there were.

The CHAIRMAN. Is that where they are thrown into most intimate connection—living together as husband and wife?

Dr. McCOY. Yes, sir; living together in the most intimate relations. Five per cent of the persons is about the maximum.

In this connection I would like to insert some data with reference to the danger of associating with lepers at Molokai.

TUBERCULAR LEPROSY, TYPICAL CASE.

(The matter referred to is here printed in full, as follows:)

THE DANGER OF ASSOCIATION WITH LEPERS AT THE MOLOKAI SETTLEMENT.[1]

[By George W. McCoy, Surgeon, Director Leprosy Investigation Station, and William J. Goodhue, M. D., Medical Superintendent, Territorial Leper Settlement, Molokai, Hawaii.]

We have collected from the available records all of the data having a bearing upon the risk of infection incurred by healthy persons living at the Hawaiian leper settlement at Molokai. This has been supplemented by personal observation and by catechizing old residents of the settlement.

The evidence concerns adults only. The duration of the contact was from a few months to many years. On account of the long incubation period of leprosy no case has been considered that came to the settlement since 1908.

For convenience of classification and to emphasize the nature of the association we have divided the contacts into two classes: First, the "*kokuas,*" or clean persons, who have lived with lepers, usually in conjugal relationship; second, other persons, including members of nursing and religious orders, all of whom lived in less close association with the inmates than did the kokuas.

The kokuas.—The word "kokua" is a Hawaiian term for which there is no exact English equivalent. Perhaps the nearest translation would be *helper,* but it means rather more than this and is employed almost exclusively to designate a person who has voluntarily gone into isolation at the settlement for the purpose of affording aid and companionship to a leper, usually the husband or wife, sometimes another relative, rarely a friend. The kokuas are practically all Hawaiians or part Hawaiians.

The Territorial board of health is authorized by law to permit a clean adult to accompany a leper to the settlement when the circumstances appear to warrant it. Upon the death of the leper or for other reasons the kokua may leave the settlement after a physical examination to determine freedom from leprosy. It frequently happens that the person remains and marries another leper. There are several kokuas now living in the settlement who have been married in succession to three lepers, and one clean woman has at present her fourth leper husband. We may remark here that usually these kokuas have no dread of becoming infected with the disease; indeed, the majority of them would welcome being declared lepers, since then they would no longer fear being required to leave the settlement, an occasional occurrence caused by insubordination.

The data are shown here in tabular form:

Male kokuas.

Married to lepers (developed leprosy, 5)	98
Type of disease of wife:	
Nodular	46
Mixed	39
Anesthetic	48
Total number of wives	133
Living with lepers other than wives (developed leprosy, 0)	21
Total number of male kokuas (developed leprosy, 5)	119

Of the 5 who developed leprosy, 2 were the husbands of nodular cases, 2 of the mixed type of the disease, and 1 had been married twice, the first wife being a nodular case, the second an anesthetic one.

It will be observed in the above table that the total under type of disease of wife (133) is greater than the total number of kokuas. The reason, of course, is that some of the men were married more than once. The same explanation applies to the table following.

[1] Public Health Bulletin No. 61, U. S. Public Health Service, 1913.

Female kokuas.

Married to lepers (developed leprosy, 4)	83
Type of disease of husband:	
Nodular	47
Mixed	27
Anesthetic	42
Total number of husbands	116
Living with lepers other than husbands (developed leprosy, 1)	23
Total number of female kokuas (developed leprosy, 5)	106

Of the 5 women who developed the disease, 1 lived with her son, who had leprosy of the mixed type, and the other 4 lived with their husbands. The husband of 1 had the nodular type, of another the mixed type, and of a third the anesthetic type. One had two husbands, the first a mixed case and the second an anesthetic one.

Of the 10 persons who developed the disease in the settlement 1 was diagnosed three years after arrival, 1 five years, 1 seven years, 1 eight years, 2 twelve years, and in the case of 4 this point could not be ascertained. These periods are, however, of no particular significance, as in every case the person had lived with the leper before coming to the settlement.

The type of leprosy developed was as follows:

Nodular	1
Mixed	3
Anesthetic	1

In the case of 5 the type could not be learned.

The kokuas considered here have remained in the settlement from a few months to many years, some of them developing the disease after leaving. Twenty-one came in between 5 and 10 years ago. None of these have become lepers.

It is quite obvious that small as the percentage is of those who have developed the disease it is not fair to charge all of these cases to infection in the settlement, as it is reasonable to suppose that some of them (possibly all) were infected outside. It is very difficult to determine the incidence of the disease among Hawaiians in general, but probably at least 2 per cent of the general native population of the islands develops leprosy, therefore the percentage (between 4 and 5 per cent) of those who come to the settlement clean and develop the disease is not so high as might be expected.

Contacts other than kokuas.—The members of this group are all Caucasians and include priests, Franciscan sisters, brothers of the Order of St. Francis, and others whose association with lepers is of a similar nature. They come into intimate contact with diseased persons in nursing them, in applying dressings to surgical cases, etc. They do not at present live in the same houses with the inmates of the settlement; indeed in most cases lepers are prohibited entering the houses of these clean persons. It is understood that in earlier years some of these persons were quartered in the same buildings with lepers. In this group there were 12 women, none of whom developed leprosy, and 23 men, 3 of whom acquired the disease—a priest (the well-known Father Damien), a brother of the Order of St. Francis, and 1 other person. The time that elapsed after the beginning of their association with lepers and the appearance of the disease was as follows: In one case 3 years, in another 9 years, and in the third 17 years.

SUMMARY.

Of 119 men, practically all Hawaiians or persons of mixed Hawaiian blood, living in the same house with lepers, 5 (4.20 per cent) developed leprosy.

Of 106 women, practically all Hawaiians or persons of mixed Hawaiian blood, living in the same house with lepers, 5 (4.71 per cent) developed leprosy.

Of 12 women, all Caucasians, who lived in such contact with lepers as is necessary in administering to their bodily and spiritual needs, none developed the disease.

Of 23 men, all Caucasians, who lived in such contact with lepers as is necessary in administering to their bodily and spiritual needs, 3 (13 per cent) developed the disease.

So far as we could ascertain the shortest period in which the disease developed after the person entered the settlement was 3 years (2 cases) and the longest 17 years.

Mention should be made of the fact that in some of the earlier reports from the settlement we find it stated that a very large percentage of clean persons became lepers; thus in a report made in 1886 it is asserted that 17 of 178 kokuas became lepers in 1 year, and in another, made in 1888, that 23 of 66 kokuas examined had become lepers. Whatever may have been the facts in the early days of the settlement it is certain that no such state of affairs exists at the present time. It is just possible that the improved general sanitary conditions under which the settlement has been operated in recent years may have lessened the risk of infection.

The CHAIRMAN. Have you studied the disease elsewhere than in Hawaii?

Dr. MCCOY. I have; not directly, but through the literature available.

The CHAIRMAN. Through the literature?

Dr. MCCOY. Yes; there is a good deal of literature on the subject. To return to the disease: Leprosy usually begins comparatively early in life, yet it is not a disease of the very young. Most cases occur between the ages of 15 and 30.

It is one of the most remarkable facts that it does not affect the two sexes equally. The world over, there are practically two male lepers for one female. No one can explain this, but it is a fact. I have here an article in regard to the fecundity of Hawaiian lepers, which I believe would be of interest to the committee.

The CHAIRMAN. Please insert it, doctor.

(The matter referred to is here printed in full as follows:)

FECUNDITY OF HAWAIIAN LEPERS.[1]

[By George W. McCoy, surgeon, Director Leprosy Investigation Station.]

The birth rate among lepers is generally assumed to be much lower than that of the healthy population living in the same country. That this view is widely held is shown by the following quotations from standard authorities:

Morrow, in the Twentieth Century Practice of Medicine,[2] says, "One recognized effect of leprosy, especially in the tubercular form, is its inhibitory influence upon procreative power. This is doubtless due to the azoospermia, which is especially marked in the advanced stage of the tubercular form, although the sterility of leprous marriages is not so pronounced as has been generally assumed," and in another place in the same article (p. 430) he states that "Sterility is a common result of marriages among Hawaiian lepers."

Manson[3] says: "Another powerful argument against the doctrine of heredity is the circumstance that lepers become sterile early in the disease."

Scheube[4] states that "The sexual functions of the patients are soon diminished or extinguished."

While engaged in work at the Molokai settlement the writer has been impressed by the number of births that occurred among lepers; therefore a study has been made of the birth rate for the period for which reasonably accurate figures were to be obtained[5] and a comparison made with the general birth rate of the Territory.

It was found that no statistics of value in the present connection were to be obtained for any year earlier than in 1900. The result of the study of the data is presented here in tabular form. In the first section of the table the figures are shown for all lepers and their consorts in the settlement, while the three following sections are devoted to the grouping of cases according to whether one or both parents were lepers.

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[1] Public Health Bulletin No. 61, U. S. Public Health Service, 1913.

[2] Vol. XVIII, p. 424, W. Wood & Co., New York, 1899.

[3] Tropical Diseases, Fourth Edition, p. 557, W. Wood & Co., New York, 1912.

[4] Diseases of Warm Countries, Second Revised Edition, p. 245, P. Blakiston's Son & Co., Philadelphia.

[5] The writer is indebted to Mr. J. D. McVeigh, superintendent of the settlement, for placing at his disposal the records from which the studies were made.

Year.	Total lepers and consorts.	Total births.	Birth rate Per 1,000.	Both parents lepers.			Mother a leper; father not a leper.			Father a leper; mother not a leper.		
				Persons in group.	Total births.	Birth rate per 1,000.	Persons in group.	Total births.	Birth rate per 1,000.	Persons in group.	Total births.	Birth rate per 1,000.
1900	1,050	16	15.2	940	15	15.9	60	1	16.66	50	0	0
1901	1,005	13	12.9	895	10	11.17	60	1	16.66	50	2	40.0
1902	926	13	14.03	822	11	13.38	58	2	34.48	46	0	0
1903	933	17	18.2	843	11	13.04	50	5	100.0	40	1	25.0
1904	910	18	19.78	802	15	18.7	60	2	33.33	48	1	20.8
1905	913	17	18.6	803	15	18.68	60	2	33.33	50	0	0
1906	879	23	26.16	777	21	27.02	50	1	20.0	52	1	19.2
1907	848	16	18.86	748	14	18.7	52	0	0	48	2	41.6
1908	837	15	17.9	745	10	13.4	50	4	80.0	42	1	23.8
1909	767	20	26.07	679	16	23.56	46	3	65.2	42	1	23.8
1910	668	13	19.4	560	8	14.2	56	4	71.4	52	1	19.2
1911	647	13	20.0	537	10	18.6	58	3	51.7	52	0	0
1912	676	19	28.1	568	13	22.8	56	6	107.1	52	0	0
Total	11,059	213	19.26	9,719	169	17.38	716	34	47.48	624	10	16.02

The most accurate figures available for the birth rate of the whole Territory are those for the year ending June 30, 1912. During this period the rate was 26.82 per 1,000 for a total population of 191,909, the number given by the census in 1910. The birth rate of native Hawaiians for this period was 24.87 per 1,000 and that of the part Hawaiians 50.06 per 1,000. It will be seen that the birth rate of the settlement, 28.1 per 1,000, for the same year is a trifle above the general rate of the Territory and above that for native Hawaiians, but much under that for part Hawaiians.

In looking over the table it will be noted that in each section there are one or more years in which the birth rate at the settlement is in excess of that of the general population or of the Hawaiian part of the population, though the majority are below this. In the averages of the total period of 13 years the only group giving a larger rate than that of Hawaiians at large is that in which the mother was a leper, the father a nonleper. The rate for the group in which both parents were lepers is approximately 7 per 1,000 less; that in which the father was a leper, the mother a nonleper, being approximately 9 per 1,000 less; and the whole rate of the settlement is approximately 6 per 1,000 less.

Probably the chief significance of the figures, aside from the very considerable number of births shown, lies in the fact that in the group in which the father was a leper, the mother a nonleper, the birth rate is only about one-third that in which the mother was a leper, the father a nonleper.

There are certain facts that must be taken into consideration in comparing the birth rate in the settlement with that outside.

Briefly these are as follows:

(1) The birth rate given for the Territory at large is smaller than it should be on account of failure to report births, while all births that occur at the leper settlement are reported, as particular attention is paid to this matter, and the entire population is under constant medical surveillance.

(2) The populaion of the settlement contains a larger proportion of adults than is found among the general population.

(3) To counterbalance this latter error is the fact that in the settlement the proportion of adults who do not live in conjugal relation is much larger than in the Hawaiian population at large. Thus, in the year ending June 30, 1912, among 622 lepers at the settlement, 225, or 36.2 per cent, lived in the different institutions, i. e., the home for men, the home for women, and the home for aged and infirm; while 397, or 63.8 per cent, lived outside in family relationships.

(4) Females constitute only about 38 per cent of the inhabitants of the settlement, while in the population at large the proportion is much higher.

(5) Another source of error is introduced by the part-Hawaiian population. This element is about half as numerous as the pure Hawaiians in the Territory at large, while at the leper settlement it constitutes a much smaller proportion of the residents.

Even when all these sources of error are considered, it remains certain that the birth rate of the settlement is by no means small; indeed, it probably falls not very far below the rate for the native population throughout the Territory.

There are other factors that probably should be considered before concluding that leprosy per se does not exercise a very strong influence in diminishing the birth rate. The chief of these is the easier economic conditions surrounding the inhabitants of the settlement as compared with Hawaiians in general. The former are provided for by the Territorial government, and doubtless generally are better fed, better housed, and better clothed than those outside. Then, possibly the knowledge that any child born at the settlement will be cared for by the Government, while outside each family must provide for its own offspring, may have an influence in raising the birth rate.

The result of the examinations of the figures may be summarized as follows:

(1) The birth rate of the Molokai settlement is probably about two-thirds as high as that of the nonleprous members of the same race outside, but the data for an entirely just comparison are lacking.

(2) The birth rate among lepers appears to depend on the fertility of the male, which probably is materially reduced.

(3) The fertility of the female does not appear to be impaired.

The period between exposure and the time the disease develops varies very greatly. Some one said here yesterday that it developed sometimes between six months and two years. I think six months is extraordinarily low—an extraordinarily short period. Two years is very short.

The CHAIRMAN. You mean after exposure?

Dr. McCOY. Yes; for the disease to develop after exposure. I have personal acquaintance with four cases which throw some light on this. One developed after 4 years, one after 17 years, and one after 7 years. Another case, which was that of a very intelligent, observing white person, developed about 30 years after her last known opportunity for contact with a leper. This person had at that time been in contact with lepers, but not close contact.

Senator WORKS. You think there is no such thing as development of the disease in a person without contamination?

Dr. McCOY. No, sir.

Senator WORKS. That is not possible, Doctor?

Dr. McCOY. It seems not. I do not think so. There are no grounds for believing that there is any development of the disease without contamination. No one ever develops leprosy spontaneously in a place where there is no leprosy.

Senator WORKS. That is what I wanted to understand.

Senator FLETCHER. What would you call exposure?

Dr. McCOY. That is a question difficult to answer. Simply living in a community where there are lepers may be regarded as exposure. I should like to insert in the record some data in regard to the distribution and transmission of leprosy in Hawaii and elsewhere.

(The matter referred to is here printed in full as follows:)

A STATISTICAL STUDY OF LEPROSY IN HAWAII.[1]

[By George W. McCoy, Surgeon, United States Public Health Service, Director United States Leprosy Investigation Station, Hawaii.]

In previous reports from this station Brinckerhoff[2] and Brinckerhoff and Reinecke[3] analyzed the data bearing upon leprosy in Hawaii to 1908, inclusive. The present paper brings the figures up to January 1, 1914, and considers some features not discussed in the papers mentioned.

[1] Public Health Bulletin No. 66, U. S. Public Health Service, 1914.

[2] Public Health Bulletin No. 26: The Present Status of the Leprosy Problem in Hawaii, Washington, 1908.

[3] Public Health Bulletin No. 33: A Statistical Study of an Endemic Focus of Leprosy, Washington, 1910.

It is quite likely that there are errors in some, perhaps in the majority, of the figures given here. The records concerning leprosy in Hawaii are far from perfect. There are duplications that are most difficult to detect, and though great care has been taken to eliminate them, some have doubtless escaped observation. The errors that may exist in these totals and percentages are, however, believed to be so small that they may be disregarded. Some of the figures do not agree with those given by Brinckerhoff and Reinecke, probably because some of the data were drawn from different sources.

Since 1909 the apprehension and detention of lepers have been conducted under a territorial law, which, in addition to certain administrative sections, contains the following:

"*Notification.*—Every person who knows, or has reason to believe, that he, or any other person, not already under the care or control of the board of health, is a leper, shall forthwith report to the board or its authorized agent, that fact and such other information relating thereto as he may have and the board may require.

"*Examination.*—Any person so reported, or otherwise believed to be a leper, may be examined at any time and place and by any physician or physicians that may be agreed upon by him and the board or its agent. The board or its agent may, however, instead request such person to appear at a designated time and place not less than five days thereafter and then and there to submit to an examination by a designated physician for the purpose of ascertaining whether such person is a leper. If, however, such person prefers such examination to be made by more than one physician, he may so notify the board or its agent at any time before the time so designated and may at the same time, or within such further time as the board or its agent may allow, designate to the board or its agent one licensed physician; in which case the board or its agent shall within five days thereafter designate to such physician a second licensed physician, and the two physicians so designated shall within five days thereafter designate to the board or its agent a third licensed physician, and if they fail to do so, such third physician shall be designated by the circuit judge of the circuit in which the examination is to be held, and in the case of the first circuit by the first circuit judge; and in case such person shall fail to designate a physician within the time allowed, all three physicians shall be designated by such judge; notice of any such designation or designations by a judge shall be given forthwith to such person and to the board or its agent; when the three physicians have been so designated, such examination shall be made by them or a majority of them at a convenient time and place designated by the board or its agent, reasonable notice of which shall have been given by the board or its agent to such person and such physicians. The physician or physicians who make the examination shall report to the board or its agent whether in his or their opinion such person is a leper. If such person is under the age of 16 years, his parent or guardian, if any, may exercise such preference and thereafter represent such person as far as may be for the purpose of this section. If upon such examination such person is found not to be a leper, the board shall furnish him upon request a certificate setting forth such fact, the date of examination, and the name or names of the physician or physicians making the examination."

This law was made necessary by reason of the fact that the act previously in force had been found legally defective in certain vital points. The essential provisions of this law are quoted in order that it may be understood just what steps are taken in connection with the apprehension of a leper, and for the reason that it is believed by the local authorities that the number of lepers coming under the control of the health department in the past three years would not have been so large under a less effective law, although the method of detecting lepers is still far from perfect. It will be observed that if this law were obeyed there would be no trouble in having every leper isolated promptly.

The first table includes the figures since the beginning of segregation in 1866 and includes some taken from the report of Brinckerhoff and Reinecke and some from reports of the Hawaiian health department, but the other tables consider only the data for a period of 13 years, ending December 31, 1913.

TABLE 1.—*Total number of new cases.*

Year.	New cases.	Year.	New cases.
1866	141	1890	184
1867	57	1891	142
1868	76	1892	109
1869	73	1893	210
1870	31	1894	137
1871	128	1895	106
1872	69	1896	147
1873	295	1897	126
1874	53	1898	80
1875	128	1899	58
1876	57	1900	102
1877	110	1901	86
1878	136	1902	87
1879	82	1903	121
1880	34	1904	96
1881	195	1905	90
1882	70	1906	54
1883	301	1907	94
1884	108	1908	23
1885	103	1909	66
1886	42	1910	47
1887	220	1911	109
1888	558	1912	138
1889	306	1913	49

The marked irregularity shown in this table in the number of lepers apprehended annually is no doubt due to the varying success of the efforts of the authorities, as there is probably no great change in the number of cases that develop.

The large number of new cases shown for 1911 and 1912 requires some explanation. In the latter part of 1911 a medical man of high standing in the community called attention to the existing status of the leprosy problem, and a great deal of interest was aroused. This resulted in strengthening the hands of the healh authorities in dealing with the subject and indirectly gave great assistance in increasing the number of cases apprehended. Patients that physicians had regarded with suspicion were submitted to expert examination, and there was a more rigid enforcement of administrative measures. Furthermore, it is believed that the operation of the new law was having a favorable influence and that the growth of a healthy public sentiment was bearing fruit.

In the next table is shown the distribution of cases by nationalities.

TABLE 2.—*Nativity of lepers apprehended.*

Year.	Hawaiian.	Part Hawaiian.	Chinese.	Portuguese.	Japanese.	European.	American.	Pacific Islanders.	Korean.	Porto Rican.	Total.
1901	61	14	5	0	3	1	0	1	0	1	86
1902	62	10	7	2	0	3	2	1	0	0	87
1903	89	8	9	6	3	0	4	0	0	2	121
1904	64	12	8	5	4	0	2	1	0	0	96
1905	68	11	4	1	3	1	1	0	0	1	90
1906	34	6	7	2	1	1	1	1	1	0	54
1907	65	10	4	6	4	2	1	1	0	1	94
1908	15	2	1	2	1	2	0	0	0	0	23
1909	51	7	1	3	0	0	2	0	2	0	66
1910	22	11	2	6	1	3	0	1	1	0	47
1911	71	18	4	7	6	0	0	1	2	0	109
1912	89	28	6	9	2	0	0	2	0	2	138
1913	29	10	3	3	1	1	0	0	2	0	49
Total	720	147	61	52	29	14	13	9	8	7	1,060

The incidence of the disease among the various nationalities in the Territory is demonstrated in the following table:

TABLE 3.

Nationality.	Population.[1]	Lepers, 1901–1913.	Proportion.
Hawaiians	26,099	720	1.36
Part Hawaiians	12,485	147	1.85
Chinese	21,698	61	1.356
Portuguese	22,294	52	1.429
Japanese	79,663	29	1.2747
Caucasians (other than Portuguese)[2]	14,684	27	1.544
Porto Ricans	4,828	7	1.689
Koreans	4,000	8	1.500
Pacific Islanders (chiefly Filipinos)	4,000	9	1.440

[1] The figures for Koreans and Pacific Islanders are estimated; the others are taken from the census of 1910.

[2] United States soldiers and sailors are not included.

It should be borne in mind that while this table shows the total number of new cases of leprosy during a period of 13 years, the figures for population are those for a single year; hence the table does not show the proportion at any one time. There have been considerable changes in the number of the different nationalities during the period, but it is impossible to get figures that would serve the purpose better than those given.

These two tables probably show a smaller number of lepers other than Hawaiians and part Hawaiians than have been detected, as it sometimes happens that when leprosy is diagnosed in a foreigner, arrangements are made for returning the patient to his native land without making a record of the case.

In the next table is shown the ages of lepers at the time of apprehension.

TABLE 4.—*Age of lepers at apprehension.*

Year.	1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	61 to 65	66 to 70	71 to 75	76 to 80	81 to 85	Total.
1901	0	4	17	19	12	9	3	9	4	2	2	1	1	3	0	0	0	86
1902	0	7	13	15	10	9	5	9	1	6	2	3	3	3	0	1	0	87
1903	1	7	23	24	18	15	7	4	3	7	5	2	2	3	0	0	0	121
1904	1	7	16	13	16	11	2	11	4	3	5	2	1	1	1	1	0	95
1905	0	4	14	12	7	6	12	11	4	7	8	3	1	1	0	0	0	90
1906	0	1	10	10	10	3	6	2	1	2	1	3	3	1	1	0	0	54
1907	2	5	9	14	14	14	9	8	5	1	6	5	1	1	0	0	0	94
1908	0	3	5	4	4	2	1	0	1	1	2	0	0	0	0	0	0	23
1909	0	3	8	9	4	7	9	10	6	4	1	1	1	1	1	0	0	65
1910	3	0	7	12	4	9	2	3	2	2	1	1	0	1	0	0	0	47
1911	0	2	19	26	17	11	10	9	6	5	2	0	1	1	0	0	0	109
1912	1	10	18	28	23	15	8	10	5	6	3	5	3	1	0	1	1	138
1913	0	3	4	18	4	3	5	3	2	2	3	0	1	1	0	0	0	49
Total	8	56	163	204	143	114	79	89	44	48	41	26	18	18	3	3	1	1,058

No age was given in 2 cases.

About half of the total number of lepers (510 of 1,058) occurred between the eleventh and twenty-fifth years, both inclusive, and over a third of the total 367 of 1,058) were persons in the second decade of life.

One of the remarkable facts about leprosy and one for which there is no satisfactory explanation is that the incidence of the disease, practically everywhere, is almost twice as high among males as among females. In the following table the sex for different ages is given; it will be noted that this preponderance of males exists throughout except at the extremes of life, where the numbers are too small to be of significance.

TABLE 5.—*Sex incidence for different ages.*

Sex.	1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	61 to 65	66 to 70	71 to 75	76 to 80	81 to 85	No. age given.	Total.
Male	3	41	93	116	92	76	62	61	26	29	24	19	13	14	1	2	0	1	673
Female	5	15	70	88	51	38	17	28	18	19	17	7	5	4	2	1	1	1	387
Total	8	56	163	204	143	114	79	89	44	48	41	26	18	18	3	3	1	2	1,060

The civil state of lepers apprehended is shown in the next table; as is to be expected, the majority are single. The disease usually attacks those who are below the age when marriage is contracted.

TABLE 6.—*Civil state of lepers apprehended.*

Year.	Married.	Single.	Widow or widower.	Divorced.	No information.	Total.
1901	26	51	4	0	5	86
1902	28	55	2	0	2	87
1903	35	75	7	1	3	121
1904	22	61	10	0	3	96
1905	38	42	4	1	5	90
1906	11	34	3	0	6	54
1907	36	49	6	0	3	94
1908	6	17	0	0	0	23
1909	26	33	4	2	1	66
1910	13	29	5	0	0	47
1911	36	72	1	0	0	109
1912	58	78	2	0	0	138
1913	17	31	0	0	1	49
Total	352	627	48	4	29	1,060

In making a study of the records to determine what association with lepers is reported one realizes that the sources of errors are extremely large. In a country where leprosy is as prevalent as it is in Hawaii a very large proportion of the population unknowingly may, and probably do, come in contact with the disease. It is also probable that when the history is being taken any association would often be concealed, as the person being interrogated would believe that the admission of his association with a leper would contribute to making a positive diagnosis in his own case. The figures indicate that association with lepers is admitted in nearly 37 per cent of all cases (391 among 1,060), and that the presence of the disease in a parent or a brother or sister constituted over half of the acknowledged associations. Where multiple association was mentioned the case was classified under the nearest relative.

The statement so frequently made that prolonged and intimate contact with leprosy is needed to bring about infection is certainly not borne out by the facts in Hawaii. Cases are all too frequent in which there is absolutely no history of any association with lepers, and this is true in some cases where the statement of the patient can be verified by reliable collateral evidence.

The acknowledged associations are shown in the following table:

TABLE 7.—*Association with lepers before apprehension.*

Year.	Father or mother.	Grandparents.	Grandchild.	Sister or brother.	Son or daughter.	Uncle or aunt.	Kokua.[1]	Cousin.	Friend.	Nephew or niece.	Husband or wife.	No information.	Total.	No association.	Grand total.
1901	5	0	0	1	1	0	0	0	1	1	2	1	12	74	86
1902	4	0	0	3	0	4	0	2	0	0	3	1	17	70	87
1903	15	0	0	12	0	2	0	5	5	2	3	7	51	70	121
1904	12	0	0	11	2	1	0	0	6	2	0	8	42	54	96
1905	12	0	0	7	1	1	0	2	4	0	3	3	33	57	90
1906	4	1	0	8	1	2	0	1	5	2	0	3	27	27	54
1907	14	1	0	5	2	4	1	1	4	1	7	2	42	52	94
1908	5	0	0	1	1	1	1	0	0	0	0	1	10	13	23
1909	13	0	0	4	0	1	1	0	0	0	2	31	52	14	66
1910	6	0	0	9	0	0	0	1	7	0	2	0	25	22	47
1911	10	2	0	20	1	2	0	3	12	0	4	5	59	50	109
1912	12	2	1	16	2	4	1	1	22	0	2	7	70	68	138
1913	5	0	0	5	1	2	0	2	5	0	0	1	21	28	49
Total	117	6	1	102	12	24	4	18	71	8	28	70	461	599	1,060

[1] Helper of a leper.

The occupations of persons segregated were given in a little over one-sixth of the cases, chiefly in later years. Those that were recorded are tabulated here:

TABLE 8.

Occupation.	Males.	Females.	Total.
Attendant at leper hospital	[1]1	0	[1]1
Bakers and cooks	2	0	2
Clerks and school-teachers	5	3	8
Cowboys	7	0	7
Drivers	10	0	10
Factory employees	0	2	2
Farmers	6	0	6
Fishermen	7	0	7
Gardeners	2	0	2
Housewives	0	57	57
Laborers	61	1	62
Policemen or watchmen	3	0	3
Sailors	5	0	5
Taro workers	12	0	12
Total	121	63	184

[1] The writer is acquainted with two cases not included in this total in which the disease developed in persons who were employed at the settlement.

The length of time that symptoms have existed before the patient comes under the control of the health authorities is probably a very important matter in determining the success or failure of segregation. In this case, also, it is probable that false and misleading answers would often be given. While we are not acquainted with the mode of transmission of the disease and do not know at what time in its course it is infectious, there is no reason for doubting that the early stages are at least as dangerous as the later ones. It should be borne in mind, in considering the length of time the disease has existed before the apprehension of the patient, that an early diagnosis of leprosy is often difficult and sometimes impossible. Nor is the difficulty confined to early cases, as the following example will show: The writer recently had occasion to examine two persons who had been inmates of the Molokai settlement for a number of years for the purpose of determining whether any signs of the

disease could be detected. In one case the microscopical examination of smears made from five doubtful lesions was negative, while the sixth, also from a doubtful lesion, showed acid-fast bacilli in considerable numbers. In the second case three examinations were made at intervals of several months; the first and second were negative, while the third resulted in the finding of characteristic organisms at the site of an old lesion. These were both cases which clinically gave only trifling evidence of skin lesions and none whatever that would, under ordinary circumstances, have been regarded as suspicious of leprosy.

TABLE 9.—*Duration of disease before apprehension.*

Year.	Less than year.	1 year.	2 years.	3 years.	4 years.	5 years.	6 years.	7 years.	8 years.	9 years.	10 years.	More than 10 years.	A life-time.
1901	8	5	6	9	3	2	3	4	6	1	3	4	2
1902	13	16	14	4	2	2	1	3	1	2	1	3	4
1903	16	14	6	13	6	7	3	6	2	1	8	2	3
1904	17	19	10	8	2	0	2	2	1	1	2	5	0
1905	11	12	6	6	3	5	2	0	1	0	3	12	5
1906	10	7	7	6	2	3	1	1	0	1	2	0	1
1907	23	12	4	6	9	2	0	0	1	1	1	1	0
1908	3	3	1	5	2	0	0	0	0	0	0	1	0
1909	2	1	0	0	3	0	0	1	1	0	0	1	0
1910	14	5	7	5	1	1	1	2	1	1	1	1	1
1911	18	22	16	8	5	7	3	5	4	2	2	6	3
1912	40	11	17	16	6	10	5	3	5	0	5	10	1
1913	13	4	5	6	4	3	4	1	0	0	3	3	0
Total	188	131	99	92	48	42	26	27	23	10	31	49	20

A number gave no information on this point.

The claim that the disease from which the patient suffers has existed from infancy is sometimes made for the purpose of misleading the examiner. This probably accounts for practically all in the last column.

The following table shows the percentage of lepers apprehended who have had the disease less than two years:

TABLE 10.

Year.	Less than 2 years.	Total number isolated.	Per-centage.
1901	13	86	15.1
1902	29	87	33.3
1903	30	121	24.8
1904	36	96	37.5
1905	23	90	25.5
1906	17	54	31.5
1907	35	94	37.2
1908	6	23	26.1
1909	3	66	4.5
1910	19	47	40.4
1911	40	109	36.7
1912	51	138	37.0
1913	17	49	34.7
Total	319	1,060	30.1

It is encouraging to note that in recent years the percentage of lepers who are apprehended early in the disease is in general larger than in the earlier years.

The question of how much weight should be given to the clinical symptoms alone in making a diagnosis is one that arises so frequently that the data have been examined for the purpose of determining how often clinical signs were

positive, while the microscopical examination resulted negatively. The following table gives the result of the tabulation:

TABLE 11.—*Finding of bacilli at official examination.*

Year.	Positive.	Negative.	No information.	Total.
1901	55	12	19	86
1902	78	6	3	87
1903	117	2	2	121
1904	90	2	4	96
1905	88	0	2	90
1906	51	3	0	54
1907	91	0	3	94
1908	22	1	0	23
1909	36	1	29	66
1910	33	7	7	47
1911	105	3	1	109
1912	118	20	0	138
1913	45	3	1	49
Total	929	60	71	1,060

It is believed in general that no serious harm would be done if a microscopical confirmation were insisted on in every case, at least prior to deportation. The only exception might be pure nerve cases, in which ulceration existed. The law in Hawaii requires that the examining board shall declare a person either a "leper" or a "nonleper," but the board of health may parole any case that is not regarded as a menace to the public health.

The following table gives the signs of onset in the cases in which it was given with sufficient definiteness to make the data of value:

TABLE 12.

Manifestations—skin lesions.	Frequency.	Manifestations—nerve lesions.	Frequency.
Spots of various sorts (macules, leucodermic areas, etc.)	271	Swelling of different parts	138
Redness and itching	23	Numbness of different parts	29
Nodules or thickening	132	Contraction of atrophy of hands or feet	89
		Paralysis of hands, feet, or face	42
		Falling of hair (usually eyebrows)	13
Total	426	Total	311

The type of the disease at the time the patients were segregated is shown in the following table. It is often a matter of some difficulty to decide under what type a given case should be classified when the patient is before one, and obviously it is much more difficult to classify cases when one is limited to the data found in the records of the examination:

TABLE 13.—*Type of leprosy segregated, by years.*

Year.	Anæsthetic.	Nodular.	Mixed.	Not given.	Total.
1901	23	25	19	19	86
1902	31	18	18	20	87
1903	53	28	35	5	121
1904	38	25	26	7	96
1905	36	20	30	4	90
1906	10	15	27	2	54
1907	26	29	26	13	94
1908	4	6	13		23
1909	42	7	16	1	66
1910	18	11	17	1	47
1911	15	73	20	1	109
1912	27	90	21		138
1913	4	37	7	1	49
Total	327	384	275	74	1,060

It has been maintained frequently that the tendency to the development of the nerve type of leprosy is an indication of the lessening of the virulence of the infection in any endemic focus of the disease. The table indicates that, if anything, nodular cases constitute a larger proportion of lepers now than they did in the past.

The financial burden of the Territory in connection with leprosy is very heavy. The following figures are taken from the report of the sanitary commission, an organization appointed by the governor under an act of the legislature that convened in 1911:

Year.	Amount spent.	Number of lepers.	Cost of each.	Year.	Amount spent.	Number of lepers.	Cost of each.
1870	$17,016.87	392	$44.68	1905	$132,250.81	858	$151.11
1875	29,698.93	754	39.25	1906	96,413.56	828	116.39
1880	43,740.33	589	74.26	1907	115,810.36	798	145.12
1885	54,131.00	663	81.65	1908	165,662.85	791	209.43
1890	169,671.20	1,213	139.90	1909	141,725.52	723	196.02
1895	116,447.46	1,087	107.12	1910	162,843.58	614	265.21
1900	118,880.03	983	120.93	1911	204,546.22	592	345.52
1904	149,325.95	994	150.22	1912	231,778.27	728	318.38

The legislature that convened in 1913 appropriated the sum of $412,130 for the care of lepers, including permanent improvements, for the two years beginning July 1, 1913.

Notes on the Study of Histories of Lepers[1] From the Standpoint of Transmission.

[By Donald H. Currie, Passed Assistant Surgeon and Director Leprosy Investigation Station.]

INTRODUCTION.

The most simple method which is employed for the eradication of most communicable diseases is the removal of the affected member from its healthy fellows.

In the case of certain diseases among the lower animals (glanders, tuberculosis, fowl cholera, etc.), this is effected by killing the diseased animal and destroying its carcass.

In the case of human beings the nearest approach to this method that humanitarian ideals will permit is the complete isolation of the diseased person from his fellows until the course of illness has terminated. When we are dealing with typhus or smallpox, this isolation is comparatively easy to effect, as the separation of the sick from relatives and friends is of short duration; but when we attempt to employ this method in the case of a disease in which, like leprosy, the duration of the illness is for the balance of the individual's life, we meet with the resistance of friends and relatives, who, in many cases, prefer to take a serious risk of contracting the disease themselves rather than to surrender the ill to what they know means lifelong and complete separation.

This is especially true when we are dealing with a people that only partially accept our teachings of the communicability of disease; especially true when the system of isolation appears to them to be unnecessarily complete in character; especially true when we deal with a people whose loyalty to family and race is better developed than any abstract ideals of upholding the law for the ultimate benefit of all.

In our present state of knowledge of leprosy it is difficult to see how we can ever hope to eradicate this disease without some form of isolation. We can not say just how complete such isolation must be to effect the results desired, as we do not know how man contracts the disease, except that he acquires it in some unknown manner, directly or indirectly, from some other person afflicted with it. But as our knowledge of transmission in other diseases has increased, our methods of eradication have, as a rule, not only become more effective, but

[1] Public Health Bulletin No. 41, U. S. Public Health Service, 1911.

also more humane, and it is safe to say that leprosy will be no exception to this rule.

Even in our present state of knowledge, certain countries, notably Norway, have developed a system of isolation which, at first sight, hardly appears strict enough to be termed isolation, yet this very country has practically stamped out leprosy by no other measures than the one referred to. On the other hand, in countries like Hawaii, where those apprehended are completely banished, absolute failure to lessen the incidence of the disease has resulted, not because the banishment of *all* cases would not eradicate the disease, but because the isolation is made so complete that the relatives of the afflicted refuse to comply with the spirit of the law and report their sick.

In the case of Norway the cooperation of the people has been secured by instituting a modified form of isolation; in the case of Hawaii the cooperation of the people has not been secured, on account of the absolute character of the isolation.

Just how completely must we isolate a leper from his fellows to make the latters' infection a remote possibility? An exact answer to this question can only be given when we have an exact knowledge of the means whereby we acquire the disease from those afflicted with it.

Now that we can grow the bacillus of leprosy on artificial media, we may hope to be able to approach the subject of transmission by a direct method of study. Nevertheless, for the present at least, indirect means of studying the problem will continue to offer hope for its solution.

Of these indirect methods of studies of this problem there are few which offer more promise in illuminating the subject of transmission than that of case study—the study of the histories of lepers for the few years preceding the first symptoms of the disease.

It must be admitted, however, that the value of such evidence depends largely upon the locality. Those places where cases of leprosy are few offer a better opportunity than places where the reverse holds true, for the reason that in the former case, when we can trace a contact, of a certain character, with a leper several years before the disease develops in the patint whos history we are investigating, it becomes reasonably certain that that patient contracted leprosy from the person referred to and during the contact described.

On the other hand, when we obtain a history in a locality so badly afflicted with the disease that the patient knows that he or she has been in contact with a leper two, three, or half a dozen times, we must presume that there have also been many unknown exposures, which makes it impossible to judge just when and by what kind of contact the disease was contracted.

It will be seen by the study of these notes that we are attempting to investigate the disease in one of the least favorable countries for such transmission studies, some of our cases having been exposed intimately, to their knowledge, several times, but even such data have their value.

As to the accuracy of the histories themselves, this is obviously most important in data of this character. We believe that the data we present here are as accurate as the average clinical history obtained elsewhere. None of the data presented here were given until we had thoroughly questioned and in some cases cross-questioned the patient after an interval of several weeks, keeping only those answers which were borne out by the further testimony of the patient.

In this connection it is hardly necessary to point out that when the average patient states that he was in contact with a certain disease at a certain time, even though the patient may be truthful, he may have erred, usually not being an expert diagnostician; but from its frequency Hawaiians have learned to know the symptoms of leprosy fairly well, probably being as familiar with them as the average person of the same class in other countries is familiar with the symptoms of pulmonary tuberculosis.

Another point to be borne in mind when considering these histories is the fear that these patients entertain that evidence of this character may be used to apprehend and isolate relatives and friends, now at large and known to the patient as suffering from leprosy. We have done all in our power to assure them that no such use would be made of such data, but this defect, of course, does not detract from the statements that they *were* exposed to a certain case at a certain time. The only way that it could influence the histories would be to withhold some statement bearing on an exposure, which they feared would be against the interest of some relative or friend.

The following histories were obtained either from patients under our care or from such under the care of the Territorial board of health.

CASE 1. Patient is about 18 years of age. He does not remember just how long he has had leprosy but knows that he had the first symptoms before he entered school. At the time that he sickened some ten persons were living with him; three of these people had leprosy at that time. He does not know how long these people had suffered from leprosy but knows that they had the disease for several years previous to the development of his first symptom. One of these persons is his father who still lives in Honolulu. The other two are cousins. Both of these cousins have since been isolated. One of them was sent over to the settlement at the time the patient was. After developing the disease the patient entered a Honolulu boarding school. He did not know of any leper being at this boarding school at that time, except himself. Since patient was isolated, however, one of his former schoolmates has been sent into isolation. This schoolmate not only attended school with patient, but slept in the same bed with him, sat beside him, and often played with him. All of this occurred, as before stated, after "Case 1" knew that he was suffering from the disease.

The first symptoms patient noticed were red spots on his cheeks. Up to the time that he was isolated he never saw a leper that he knows of, except the three persons living in the same house with him. He has brothers and sisters, who are well; no relative other than the two cousins has even been sent to isolation.

When he entered isolation he found a leper there whom he had known in Honolulu before the former developed leprosy, but there is no history of intimate contact with this case. He has had what he believed to be itch, but only *after* he developed leprosy. He was vaccinated while at school, i. e., *after* he developed leprosy.

CASE 2: Patient is 56 years of age; a Hawaiian of intelligence; has had leprosy for the last three years. His first symptoms were red spots on his forehead. He gives the following history of known exposures to the disease: He lived in the house with his father, who had leprosy and died of this disease in 1886. His father suffered from this disease for three (?) years previous to his death, all of which time was spent in the latter's residence in Honolulu.

In 1902 patient was employed as a nurse in Hilo, Hawaii, and for the next four years he nursed a leper in the Hilo Hospital. He developed the disease himself about at the end of this nursing service, and one year later, i. e., 1907, he entered the Kalihi isolation station. None of his relatives were ever sent into isolation. None of the patient's friends were isolated previous to patient being isolated. Some of his friends have been isolated since he entered isolation himself. He had known persons with whom he went to school that were isolated afterwards, but this, of course, was long ago. When serving as a policeman, he sometimes had to arrest lepers. He never was sick with any disease other than this one, never had itch, and was vaccinated fifty years ago.

CASE 3: The patient is 18 years of age; he developed leprosy two or three years ago. His first symptom was white spots "all over him." At the time he sickened four persons were living with him; they were all well and have remained so. He never lived in the same house with a leper, but his cousin, a leper, lived 300 yards away from him, and the patient often visited him. Patient's grandmother also had leprosy before he developed leprosy; she lived in the same house with the leper cousin, previously mentioned. The two mentioned relatives have had the disease about six years. His cousin came into isolation with him, but his grandmother was not isolated until last year.

When patient entered isolation he knew no one at Molokai; none of his schoolmates have ever been sent into isolation.

He has had itch, but developed it since he acquired leprosy. He was vaccinated at school nine months before developing the disease.

CASE 4: The patient, a European, is 45 years of age. He first noticed difficulty in breathing through his nose. He had no other symptoms except this difficulty in breathing for a period of five years, when eleven years ago spots came out on his body, the first one appearing on his right leg. He was isolated eight years ago, i. e., three years after the spots appeared. He gives the following history of exposures: He lived with a woman who had just previously lived with a man suffering from leprosy. The woman did not develop leprosy; patient lived with this woman for about a year. It was about three years after patient ceased to live with this woman that the nasal symptom appeared.

Patient had also worked for a man in Honolulu who had leprosy and who afterwards died in isolation at Kalihi.

Upon cross-examination, patient states that the man who had previously lived with the woman referred to and who was afterwards isolated, lived for some time in the same house with the patient in Honolulu, and they sometimes ate together.

Patient was vaccinated as a child in Europe and again in 1901, i. e., after he had developed leprosy, but a year before he was isolated.

CASE 5: Patient is 17 years of age; developed leprosy about seven years ago. He remembers that his first symptom was a "little white spot," but he forgot where it appeared. He has never lived with a leper. None of his relatives have leprosy, and the only history of exposure he gives is that while attending school in Honolulu, when he was 8 years of age, there was a boy in the same class with him, who was shortly afterwards sent to Molokai. This boy sat in the same seat with with patient, and, to use the patient's words, "had plenty of sores."

Patient has had itch, but not until after developing leprosy. He was vaccinated when he was small.

CASE 6: The patient is only 12 years of age, and, therefore, his history can not be of much value. He does not know how long he has had leprosy. He only knows that his face became red and then white spots appeared on his abdomen and back. Three people were living with him at the time that he sickened, but they have remained healthy. He was isolated three years ago; none of his relatives have ever been lepers that he knows of. The only exposure that he remembers was being taken once to the Kalihi receiving station, presumably to see some friend of his family, who had been isolated. Nothing more definite in the form of a history could be obtained from this child.

CASE 7: Patient does not know his exact age, probably about 18 years. Developed leprosy when a child. Remembers seeing first spots on his back and legs. As a child he played with a leper. He knows nothing of his parents.

Patient was isolated nine years ago, but he does not remember how long he was sick previous to his isolation. He never attended school. Patient had an uncle sent into isolation before he could remember and, he believes, before he was born. Patient also had a cousin sent to isolation before he came himself. He never saw this cousin until he saw him at Molokai.

Patient had itch when he was about 7 years old and has also suffered from rheumatism. He has never been vaccinated.

CASE 8: Patient is 24 years of age. He developed leprosy eleven years ago. His first symptoms were white spots on his buttocks. At the time that he sickened 14 other persons were living in the house with him, and 3 of these were suffering from leprosy. He was isolated in 1902, i. e., three years after he developed the first symptoms of leprosy.

Patient has a grandfather, uncle, sister, and cousin who have been sent to Molokai with leprosy. He has friends who were sent to Molokai before he was sent, and other friends have been sent over since he was isolated. Some of these persons are former schoolmates of his.

Patient had itch when he was 11 years old, two years before he developed leprosy. He was vaccinated when 14 years old, i. e., about the time or after his first symptoms developed.

CASE 9: Patient is 18 years of age. He developed leprosy seven years ago, the first symptoms he noticed being light-red spots in his face. At the time he sickened six other people were living in the house with him. They were healthy and have remained so. He never attended school with a person whom he knew at that time to have leprosy, but from the boarding school he attended one boy was sent into isolation at the same time that the patient was, and another boy from the same institution was sent into isolation after the patient was isolated.

Patient entered isolation three years ago, i. e., four years after developing the disease. He has been vaccinated three times, had itch after he entered isolation, but never before he developed leprosy.

CASE 10: Patient is 20 years of age, of European parentage, and lived among good surroundings. He developed leprosy last year and was isolated three months afterwards. The first symptoms he noticed were red spots in his face and numbness of hands.

He never saw a case of leprosy until he developed it himself. He had an uncle who was sent into isolation before the patient was born. Fifteen years before developing the disease the patient played with a boy who afterwards

died at Molokai of leprosy. With the exception of the uncle and the boy mentioned, no friend or relative of the patient was known to have leprosy before patient himself developed it, nor have any of his friends or relatives been isolated since the patient entered isolation. Patient sometimes went on fishing expeditions and during these spent nights in the houses of Hawaiians.

Case 11: Patient is 69 years of age, and developed leprosy two years ago, entering isolation a few months later. The first symptoms that he noticed were "spots on his body," swelling of left ear, and numbness in hands. Patient has seen several lepers, but only casually in the streets of Honolulu; knows of no intimate exposure, but his duties were such as to bring him in daily contact with many Hawaiians. He never had any serious illness up to the time he developed this trouble.

Patient never had itch; was vaccinated in 1880. None of his friends or relatives have leprosy.

Case 12: Patient is 32 years of age. He developed leprosy five years ago; entered isolation two years ago. The first symptoms he noticed were a few spots on his back.

None of patient's friends or relatives have ever had leprosy. He never lived with a leper. He has seen lepers on the Island of Hawaii, but did not recognize the disease at that time. Some of his casual acquaintances have since been sent to Molokai, but no history of intimate exposure could be obtained.

Patient never had itch; was vaccinated when a child.

Case 13: Patient is 50 years of age; a well-developed case; states she does not know how long she has had leprosy. She was isolated eight months ago. Up to about the time she sickened she was engaged in the manufacture of poi.

Patient was vaccinated fifteen years ago; never had itch. The patient, before illness, resided in a small village on the island of Molokai, some distance removed from the leper settlement on the same island, and a district that has furnished a considerable number of cases of leprosy.

Case 14: Patient is 20 years of age. She always lived in Honolulu. The first symptoms she noticed were red spots "all over her body." Patient claims to have had the disease eleven months, but in this matter she evidently desires to avoid our knowing the facts. She was isolated nine months ago. Her sister died of leprosy in isolation nineteen years ago. Her grandmother and uncle had been sent to Molokai with leprosy. The patient "stayed sometimes at houses where lepers lived," and "knew lepers in the country, but all are now on Molokai;" she also adds that she played with lepers when a child. She did not go to school with a leper that she knows of. Patient's answers regarding lepers she has known are guarded, probably due to the fear that such information might lead to the apprehension of some of her friends, now at large.

Patient has had itch; was vaccinated while at school.

Case 15: The patient is 17 years of age, has had leprosy for seven years, and was isolated three months ago. Two boys with whom he went to school and often played with were sent into isolation before he was. He has "seen people taken to Kalihi with leprosy." He has always lived with his parents in Honolulu. None of his relatives have leprosy.

Patient had itch several times before developing leprosy and was vaccinated when he was 6 years of age.

Case 16: Patient is 16 years of age; states he became sick three months ago. The first symptom he noticed was the appearance of macules on the face. One of his sisters developed leprosy some years ago and died of it. Patient played with this sister while she was suffering from the disease. Patient has attended a certain Honolulu school; while there one of his schoolmates was sent to Molokai. Besides this sister and schoolmate patient has seen "several" other lepers at the school he attended. He was vaccinated when small. Never had itch or any illness before developing leprosy.

Case 17: Patient, 14 years of age, developed leprosy eight months ago; first lesions being macules on both legs, posterior aspect.

Patient's brother developed leprosy some time ago and patient played with him while latter was suffering from the disease. Patient's sister is also a leper, developing the disease ten months before the patient did; sister now at the Kalihi receiving station. Patient also has three cousins that are lepers.

She states further that some of her friends have developed the disease and are now also at the Kalihi receiving station. She lived in Kauai and attended school there, but never saw a leper at the school she attended. Has never had any illness previous to developing leprosy. Has never been vaccinated.

CASE 18: Patient is 14 years of age; has had leprosy two years. Disease began with macules on legs, just above ankles. Patient only knows of one exposure—and that with some doubt—a girl lived near her in Honolulu that patient thinks was suffering from leprosy. She played with this suspect up to three years ago. All of patient's family are well, and she never saw a leper among her schoolmates. Patient has never had itch. She was vaccinated four years ago.

CASE 19: Patient is 12 years of age; both he and his brother developed leprosy at the same time, i. e., six months ago. First symptom patient noticed was a macule on left cheek.

He does not know when, if ever, he was exposed to the disease; none of his family have ever suffered from it that he is aware of. He attended school in Honolulu; none of his schoolmates nor his friends have developed the disease, as far as he knows.

Patient has never had itch; he was vaccinated six years ago.

CASE 20: Patient is 17 years of age and sister of "case 17." Developed leprosy eighteen months ago. First symptom noticed was a "cold," followed by nodular lesions of left arm. Otherwise her history agrees perfectly with the history given by her sister.

CASE 21: Patient is 18 years of age; has had leprosy for three years, the first symptom appearing on the left foot. Patient has one brother and one sister who also developed leprosy some years ago, the former having died of leprosy at Molokai. Also one of the patient's friends developed leprosy some time before the patient himself did.

With the exception of these cases, the patients' statements are somewhat vague.

SUMMARY.

From the data gained in these few histories the following points are worthy of notice:

First. A large percentage of the cases give a history of exposure to leprosy some time before they themselves developed the disease. Usually such exposures were of an intimate character.

Second. While itch was a common disease among these cases, there appears to be no definite evidence that a connection existed between the occurrence of itch in some of these patients and the subsequent development of leprosy.

Third. There is nothing in these histories to indicate any relationship between vaccination and the spread of leprosy.

Dr. McCOY. The case I mentioned to you before, which developed within seven years after exposure, was the case of a man who had never seen a leper so far as he knew, but was a soldier who served in the Philippines and in Hawaii, and who doubtless had been thrown into contact with them without recognizing them. He returned to the United States and about seven years later developed leprosy.

Senator WORKS. If that be true, the matter of climate, of food, of nutriment, would have nothing to do with the actual contracting of the disease, would it?

Dr. McCOY. Exposure seems to be the essential thing. As I have said, if a person is infected, the period is very long before the disease develops. It is very seldom under three years when these symptoms develop.

The CHAIRMAN. Is it possible that climatic conditions or food might aggravate or alleviate the disease?

Dr. McCOY. It is possible, perhaps, but there is nothing very definite on that subject. Later I have something to say on the geography of the disease which might have a bearing on that.

The CHAIRMAN. All right.

Senator WORKS. It was rather suggested to my mind by the fact that some investigation, recently made in the case of pellagra, developed the fact that the disease is developed in a person by food.

Dr. McCoy. That seems to be established in pellagra. Our own public health service worked that out very thoroughly, and the very same sort of work has been done in the case of leprosy, but it did not work out as due to diet conditions.

Senator Works. It did not show that result?

Dr. McCoy. No. Without infection a person does not develop the disease.

As to symptoms of the disease. It sometimes happens that anywhere up to one or two years a person will not have any outward manifestations of the disease, but will have fever every month or every two or three months. This does not necessarily occur, but it is tolerably frequent. Usually the first indication that anyone has been infected with leprosy is the development of spots on some part of the body, more often the face, frequently the hands and arms, or they may occur anywhere.

The Chairman. What kind of spots?

Dr. McCoy. There are two general kinds. There are the red spots, often a little bit swollen. The other kind has just the reverse, and there is a blanching of the skin, a whitening and a loss of color. On which kind of spots appear depends somewhat the future course of the disease. If the red spots appear, little livid lumps rapidly developing, it likely will be the nodular type, which is the more fatal. The white spots indicate generally the nerve type of the disease, which ordinarily stretches out through many years. You may have a period running up to a year or more, perhaps, during which the person has become apparently clean again, and then the spots come out once more, usually more widely distributed and larger, more pronounced.

Senator Fletcher. Is there any scaling when these changes take place?

Dr. McCoy. Not early in the development of the disease, but later that occurs.

The spots grow larger, sometimes swelling and becoming very thick. There will be lumps all over the countenance, some of them as big as the last joint of the thumb, or larger. The eye brows fall out. It is a peculiar thing that the hair of the scalp is not affected. These spots come on various parts of the body. Curiously enough, they very seldom appear on the private organs, either in man or woman. The private organs and the scalp seem to be places on the body that are exempt. It is a very curious thing, but it is true, nevertheless. The individual may feel relatively well while all this is going on. Perhaps the majority of cases won't be very materially affected in their general health. When taken into an institution and given proper food and proper care they often will even begin to gain in weight and feel pretty well.

These spots, in due time, are very likely to begin to ulcerate and break open, the surfaces becoming bloody and pus appearing on them. Later the disease is likely to attack the internal organs, and these are cases that ordinarily prove fatal.

To go back to the cases where the white spots are seen, I may say that these are usually of the nerve type, as I believe I have said before. They are very slow in developing. The white spots may appear somewhere else on the body. It is a very peculiar fact that these usually lack sensation. You can prick them with a pin and

there is no sensation. The prick is not felt. Sometimes paralysis of the hand develops. The fingers will shrivel and bend up like a claw. That is the typical "claw hand" of leprosy. The nerves become involved and sometimes you can feel the enlarged nerve. These are symptoms of this type. These two types of cases, the nodular and the nerve, may occur in the same individual, making a mixed type.

I want to mention another thing as a matter of considerable importance in connection with these two types. If our present views are correct as to the cause of the disease, the cause being a germ, the nerve type is of very little danger to the community. The communicable element in this type is locked up in the nerves. There is nothing like the danger that there is in the other type, as was described here yesterday, where the patient exhales the germ and where it is found in his nasal secretions.

Senator WORKS. Have you been able to discover any difference in the germs that produce these different effects, one of the nerve type and the other of the nodular type? The one germ, as I understand it, affects the nerves, and the other affects the outer portion of the body. Have you been able to discover any difference between them?

Dr. MCCOY. No, sir. That is one of the problems to which I have devoted much study and time.

It seems there ought to be some distinction made between persons afflicted with the nerve type, which might be characterized as the benign type, and the other type, the nodular type, which is so much more dangerous.

Senator WORKS. In your use of the word benign, do you mean to convey the idea that the patient who is suffering from the nerve type suffers less than a patient who has the nodular type?

Dr. MCCOY. Well, lepers do not ordinarily suffer very much. It is not a very painful disease.

Senator WORKS. It is rather singular that an affection of the nerves would not cause pain?

Dr. MCCOY. There is very little pain in many cases. These nerve cases may have very severe neuralgia. Probably the nerve type is not very dangerous. The danger really comes from the nodular type, where the patients throw off the germs through the nose and mouth or from ulcers.

The CHAIRMAN. What kind has Mr. Early?

Dr. MCCOY. I have never seen Early.

Dr. RUCKER. He has the nodular type, I think.

The CHAIRMAN. The nodular type?

Senator FLETCHER. Yes.

Dr. MCCOY. The nerve cases, to which I refer as benign, live longest. These are the cases which give rise to the terrible mutilation which you sometimes see in lepers. Parts of the fingers drop off and sometimes the whole hand back to the wrist, and sometimes the toes are affected and parts of the foot.

In administering a leprosy law it is well to keep in mind these classes of cases, and the fact that some are dangerous and some probably are not. This is a matter which requires very close attention. Some of those cases that are not dangerous may require commitment to an asylum as a matter of charity or they will become public charges. Some nerve lepers are committed in Hawaii, because

they want to come and not because they are dangerous to society. They actually seek admission there.

Senator FLETCHER. They can not perform labor and make a living.

Dr. McCOY. No; they can not perform labor so as to make a living. Nobody wants them around to work. That is it exactly. The family can not support them, and they come to the leper hospital, where they are well taken care of.

Does that cover the manifestations of the disease in a way that is satisfactory to the committee?

The CHAIRMAN. I think so; yes, sir.

Dr. McCOY. The disease is usually very easy to diagnose, especially the nodular type. The nerve cases are a little different and are not always easy to diagnose. Often your diagnosis has to be based on clinical experience.

A good bit has been said here as to the prospect of a cure for a leper. During my experience in Hawaii we discharged about 40 cases. I have been asked if I have ever seen a leper cured, and I have always answered that I do not know whether I have seen one cured or not, but that I have seen a good many get well.

The CHAIRMAN. That is, you have seen them get to such a stage that the disease would not return?

Dr. McCOY. The disease is arrested, but as to whether it will return or not I have not been able to say.

The CHAIRMAN. You can not say whether treatment is curative or not?

Dr. McCOY. No; the remedies we have used have been beneficial, but whether they are definitely curative in any case is a matter about which I am somewhat skeptical.

Senator FLETCHER. Have you reached any conclusions on the question of whether a man who has reached the age of 30 years before he takes the disease will be likely to live as long as one who takes it at the age of 15 years?

Dr. McCOY. For a long time I had the impression that the younger, or the earlier in life, leprosy appeared the more rapidly fatal it was, but my experience in Hawaii rather compelled me to revise that view. I doubt if there is much difference depending on the age of infection. The life of a leper averages about 10 years. It depends, of course, somewhat on how the patients are looked after; what provision is made to look after them, what food, etc.

Now, as to the treatment of leprosy. A good many remedies are used. Chaulmoogra oil is probably the best.

I would like to mention something about the surgical treatment of leprosy; not that it is curative at all, but it gives relief. Dr. William J. Goodhue and Dr. H. T. Hollmann, in Hawaii, and Dr. A. A. O'Neill, in San Francisco, have been and are doing excellent work in the treatment of leprosy. A study of their methods showed me that you can do a great deal toward ameliorating a leper's condition; for instance, by amputating a finger which has a lot of dead bone in it; or by taking off a foot which is riddled with pus pockets and stinking and rotten, so that you can smell it for half a block; or by removing disfiguring nodules. Sometimes a patient suffers from a closing of the larynx, so that breathing is difficult. We perform an operation upon the larynx, and the improvement that results from this is amaz-

ing. Dr. Goodhue has performed a good many of such operations. In every case the tracheotomy tube is put in. They wear that from a few weeks to a few months, and then get rid of it. The larynx heals up, and the patient is benefited tremendously. I think that feature is not given so much attention as it should be given. In any such institution as is proposed by this bill, surgical aid would be provided for.

Senator WORKS. It is not curative, but it prolongs the life of the patient?

Dr. MCCOY. It is not curative, no; but it benefits the patient a good deal.

Senator WORKS. It would seem to be a question whether this is a humane thing to do, to prolong a case like that. Of course, from the doctor's standpoint, it is all right.

Dr. MCCOY. Lepers like to live just as well as other people. Life seems to be as sweet to them as it does to the rest of us.

Senator FLETCHER. Are they generally hopeful?

Dr. MCCOY. Not about being cured. They are, however, hopeful in a general way; they become philosophers and resolved to get as much out of life as they can.

Senator WORKS. Death is no more certain for them than it is for the others.

Dr. MCCOY. No.

From a study of the geography of the disease it is very curious to note that there are certain zones in which leprosy spreads more rapidly than in other places, and there are other zones in which it does not spread at all. New York State has been mentioned here a good many times. I think it is a fact that in New York State leprosy shows no tendency to spread. I think that is true, generally, in the northern part of the United States. It does not seem to spread there so much as it does in the southern part of the United States. Offhand, this looks like the warmer countries—the warmer climates—are more favorable to the disease than the colder climates; but, as was brought out here yesterday, Iceland has lepers, and Scandinavia has lepers, and has had for a great many years. The Pacific coast seems to be a place in which leprosy spreads very slowly, or with great difficulty. So far as I know at the present time there have been but two or three cases which developed in California in persons who have never been out of the State. Just what the facts mean no one knows.

Senator WORKS. You expressed your doubts about the curative effect of drugs as applied to lepers. That doubt as to the effectiveness of drugs has been extended to others, has it not?

Dr. MCCOY. I think so.

Senator WORKS. There is less faith in drugs now than there was a few years ago?

Dr. MCCOY. Yes; there is a tendency to fewer drugs.

Senator WORKS. As I understand, you are now talking about preventive remedies?

Dr. MCCOY. Preventive remedies; yes. That is the tendency nowadays.

Senator WORKS. I remember being on board the flagship of the Pacific Fleet and the surgeon asked me to go through the ship with him. I did. It was in ideal condition, as far as a layman could see. Everything was clean and in a sanitary condition. I asked him after

we got through, "What drugs do you use?" He said, "I do not use any drugs; I do not believe in drugs. There are only two known specifics for any disease." He mentioned them, and one of them was for a very common disease and the other one he mentioned was one which I knew, and which, I am sure, you would, too. I have talked with a number of physicians since and they have expressed that idea—that they have less faith in drugs and more faith in preventive measures.

Dr. McCoy. The tendency nowadays is toward preventive medicine.

Senator Works. The tendency now is to get away from medicines and drugs?

Dr. McCoy. Precisely; and to use preventive measures.

Senator Works. "Medical practice" is pretty nearly a misnomer nowadays?

Dr. McCoy. Yes; in many instances.

The Chairman. Physicians do give a good deal of medicine nowadays, although perhaps not as much as formerly.

Senator Works. That is because it is demanded, and not because the doctor wants to give it.

Dr. McCoy. That is true, sometimes.

Senator Works. Sometimes they give them bread pills.

Dr. McCoy. Possibly.

Senator Works. A Senator gave me a very interesting case not long ago of a patient who lived out in the country. He was not in a very serious condition. The doctor made up some medicine for him, and said, "Now, you take it at a certain hour," naming the hour. "Don't you make any mistake about the hour." He gave him the time that it should be taken and told him he thought it would help him. There were no drugs in it at all. But the man came back a little later and said it was wonderful what effect the medicine had on him.

The Chairman. The effect was probably psychological.

Senator Works. Apparently so.

Senator Fletcher. Have you made any observations as to the progeny of these people, where one parent or the other is afflicted?

Dr. McCoy. When the Hawaiian settlement was established, children often were allowed to go in with their parents. Children were born in there. Of those children who lived in the settlements it was found that a comparatively small percentage developed leprosy; in fact, it probably did not exceed 7 per cent. They lived there with one or more of their parents and under conditions where there was opportunity to contract the disease. About 15 years ago the Hawaiian Government established a home in Honolulu for the care of children born in the leper settlements. The procedure now is this: As soon as a child is born in the settlement it is taken away within a few hours and put in a clean nursery, which is maintained there by the Hawaiian Government, and the child is kept there until it is anywhere from 1 to 2 years old. Then it is put in the girls' or boys' home, as the case may be, and taken care of by the Government until the girl or boy reaches the age of 18 or 20 years. The girls marry usually, and the boys are put in a machine shop or something of that sort. Since that system was inaugurated there has been not

one single girl develop leprosy and only one boy; and the total number of cases so far is almost a hundred. A good many of these children are still too young to show leprosy even if infected; that is, they have not reached the age when leprosy is likely to develop, and some of them may develop it yet, but the probabilities are that they will not. When the children are taken away at once, as they do now, they have very little opportunity to become infected.

The CHAIRMAN. I infer from what you say that the disease is not hereditary?

Dr. MCCOY. That is well established.

The CHAIRMAN. That is well established?

Dr. MCCOY. Yes. That is one of the few things that is well established in leprosy that you can feel perfectly sure about.

Senator FLETCHER. What does that indicate to your mind?

Dr. MCCOY. That goes back to a very broad biological foundation. I shall not go into a discussion of that here, of course; I do not think it necessary. Leprosy seldom develops in early life. That is true except in a very small percentage of cases. They don't develop it within the first five years. I had never seen a leper under 5 years of age until the last three or four months, when I saw a child 19 months old. That was a distinct exception.

Senator FLETCHER. You say this is not a blood disease?

Dr. MCCOY. It is not a blood disease in the ordinary acceptation of the term.

Senator WORKS. In what way do you think the infection passes from one person to another?

Dr. MCCOY. That is a thing about which I have no information at all. I have studied it over and thrashed it out in my mind, and it has been thrashed out by many brighter minds, and as to that point we are still in the dark.

Senator WORKS. There is nothing to indicate that the germ gets into the stomach and develops there, but the symptoms appear somewhere else in the first stages of the disease, as you say?

Dr. MCCOY. There is nothing to indicate that. One theory is that the germs get into the nose, and infection comes that way, just as in pneumonia and la grippe and things of that sort. That is a very soothing but not very satisfying explanation.

Senator WORKS. I do not know anything about leprosy that is peculiarly satisfying.

Dr. MCCOY. No.

The CHAIRMAN. Is it communicated by some sort of insect, such as a bedbug?

Dr. MCCOY. There are a number of advocates of that theory. We have done a lot of work along that line at the Hawaiian station, but without throwing any light on it at all.

Senator WORKS. The fact that it is not a blood disease would rather refute that, because in that case it would enter into the blood and be transmitted through the system in that way, would it not?

Dr. MCCOY. That would not have much bearing on the transmission.

Senator WORKS. You do not regard leprosy as a blood disease?

Dr. MCCOY. We do not in the usual meaning of the expression.

Senator WORKS. Of course, that would not be absolute proof.

Dr. McCoy. No, but the theory is interesting.

Senator Works. That would strengthen the view of it.

Dr. McCoy. Yes.

There are a few things that came up yesterday about which I would like to say something if it is agreeable to the committee.

The Chairman. Certainly. It is all very interesting. Go ahead.

Dr. McCoy. One witness or another has brought in and discussed about all the leprosy foci in the world with one exception. It appears that the German focus has been overlooked. The history of that focus is very interesting as showing what may happen sometimes even in a highly cultured community. Along about 1870—I am not sure of the date—a Russian servant girl, from one of the Baltic Provinces of Russia, which are badly infected with leprosy, went into East Prussia. She was an early leper when she went in. No one recognized it. She speedily became worse, and from that girl the first other case was the landlord of the hotel in which the girl worked, and then his wife. You must remember that there never had been any leprosy in all that region before. It ran into 50 cases, when it attracted the attention of the authorities. I think this total of 50 cases required not far from 30 years to develop—a good long period, at any rate. A sanatorium was established and isolation of the lepers carried out. Of course, the disease gradually died out and these lepers died off, until there are now about 8 or 10. I think that is the number; anyhow, it is a very insignificant number.

That is the only focus of leprosy in the German Empire, so far as I know. It is an interesting example of how the disease will spread in such a community.

It was mentioned here by several witnesses that cases come in and pass the critical inspection at our ports of entry. It is very true that the disease has come into the United States in this manner. In the first place, early cases of leprosy often have such mild and insignificant symptoms that nothing but a most rigid examination with leprosy particularly in mind would serve to disclose it; and, in the second place, there is the long period which elapses between infection and the appearance of symptoms.

The Chairman. It would be impossible to discover the disease if the symptoms were not present, as your last remark indicates.

Dr. McCoy. That is so; it is utterly impossible to detect the individual who had recently been exposed and infected with the disease, and in whom the symptoms had not appeared yet. And even in the other case it would require a kind of examination that would be impracticable to give; that would be out of the question.

On the question of shifting the cases from State to State and county to county: This is a thing that I have been brought into contact with a couple of times. The position taken by a gentleman here yesterday, that he would give the leper permission to go away provided the leper promised to remain away, is rather typical. A few years ago I was on duty in San Francisco at the Public Health Service laboratory there. A man came in, bearing a letter from the health authority of a Western State, not an adjacent State, but one not far away. The letter was addressed to Dr. Blue, and read something like this:

"DEAR DR. BLUE: I am sending you a man whom I have had under observation for some months, and I am inclined to suspect he has leprosy."

The man was such a plain leper that you could tell him a block off. The man was in San Francisco and could not be shipped away. That was clearly shifting the responsibility from one State to another. He knew that when the man got to San Francisco, being a leper, he would be taken care of by the city. San Francisco was compelled to bear the burden of maintaining him.

In California they have had some difficulty about shifting cases from one county to another. California has, in some respects, a very good leper law. It makes leprosy a quarantinable disease and requires isolation, and it imposes this duty upon the counties. The only county that has come forward and provided adequate accommodation for lepers is San Francisco County. That big, generous community has provided for lepers in a most magnificent way, and it has accommodations for a limited number of the unfortunates, not to exceed 20 or 25.

Some of the other counties in the State of California have no provision. A few months ago when I was in California the secretary of the State board of health was very much concerned because some of the southern counties were shifting the lepers back and fourth. None of them had provided for taking care of the lepers.

Senator WORKS. How about Los Angeles County?

Dr. MCCOY. Los Angeles County has a little building which is a part of the city and county hospital. A leper is picked up there and sent out there and incarcerated. If he feels like it he remains, and if not, he goes out, sometimes leaving on the same day that he came in.

The CHAIRMAN. Evidently they do not guard them very carefully.

Dr. MCCOY. No; but that is not as bad as it sounds. They are very largely Mexicans, and as soon as a man finds out that he is a leper and finds out that he is going to be detained by the authorities and isolated, he immediately goes across the border, back into Mexico.

Senator WORKS. It is a very nice thing to live near the Mexican border in that case.

The CHAIRMAN. Are there many lepers in Mexico?

Dr. MCCOY. Yes, sir.

Senator FLETCHER. In what portion of Mexico are they?

Dr. MCCOY. They are pretty well scattered throughout Mexico.

The CHAIRMAN. As a matter of fact, there are a great many more lepers in tropical and semitropical countries than there are in the colder countries, are there not? You started to tell us of the geography of leprosy, but you did not finish it.

Dr. MCCOY. What you say does not hold entirely. For instance, Russia has tens of thousands of lepers, and Scandinavia has had very large numbers of lepers, but by rather careful isolation and segregation the number has been reduced until it is pretty low now in Norway. Sweden has made less pronounced progress in that work; her efforts in that line have been less vigorous.

The CHAIRMAN. It is perhaps due to more vigorous measures taken in the colder countries than in the Tropics that this difference in the numbers is due?

Dr. McCOY. I think, on the whole, the Tropics are undoubtedly more favorable for leprosy to develop in than the colder climates, but there are many exceptions to that.

The CHAIRMAN. What country has the most lepers?

Dr. McCOY. British India.

The CHAIRMAN. More than China?

Dr. McCOY. There are lots of them in China, but not so many as in British India. In China leprosy is largely confined to the south.

Senator FLETCHER. Are there stations in British India?

Dr. McCOY. Yes. These are on a purely charitable basis. There is no compulsion. In British India a law was passed which prohibits lepers from engaging in certain occupations, such as handling food, serving as house servants and nurses, and things of that sort. The same thing prevails in Egypt.

The CHAIRMAN. How about leprosy among the negroes?

Dr. McCOY. I have had no experience with them. It is very prevalent among the black tribes of Africa. I was interested in what was said here about the disease being less prevalent in Louisiana among the negroes than among the whites.

The CHAIRMAN. That was stated yesterday.

Dr. McCOY. Yes. I was not familiar with it.

The CHAIRMAN. There is a great deal in Africa, is there not?

Dr. McCOY. In Africa practically nothing has been done toward stamping it out, and it perhaps reaches the acme of its development there.

Senator FLETCHER. It is true that negroes do not have yellow fever so much as the whites.

Dr. McCOY. In regard to the yellow fever, the facts are a little different. We know that the negroes have it as children and become immune, and an adult negro very rarely has yellow fever. That is the common explanation of why yellow fever is not so prevalent among the negroes.

Senator FLETCHER. How is it that the station there in Hawaii costs so much to maintain? You do not require many nurses, do you?

Dr. McCOY. Not so many.

Senator FLETCHER. You figure that $10 a month for each patient would be about $6,800 a month for 680 patients, and for a year it would be twelve times that amount, or something like $81,000?

Dr. McCOY. That is a question I have thought about a good deal. The actual cost of feeding these people is not the only large element by any means. The number of employees required is larger than you might expect, at first sight. They require in the neighborhood of 18 or 20 nurses, a couple of physicians, a superintendent, and clean helpers. Lepers are peculiar in one respect; they do not want their food handled by other lepers. Men handling the food must be clean men, and the butcher must be a clean man. The cost of medical attention is very large. It will run up to about $25,000 a year. There are a good many dressings, as there is a good deal of dressing required by ulcers. Of the $200,000 none is wasted.

Senator Works. Do the physicians visiting there and attending these patients take precautions to avoid infection?

Dr. McCoy. One of these physicians lives in the leper settlement all the time. He has, of course, a separate compound, just as the Federal officers have a separate compound in the settlement.

Senator Works. What precaution do they take against infection?

Dr. McCoy. The precautions are not very rigid. After they treat the lepers in a medical way, they change their clothing before going home. Of course, they wash their hands. They never wear rubber gloves, except at operations. The risk is so little, at any rate, that they do not feel that they are taking a risk. Attending physicians on lepers do not often become infected. But during the last year there died in England Sir George Turner, who had been a physician to the Pretoria Leper Asylum in South Africa. There are a couple of other physicians on record. There was a statement made here to the effect that an attendant has never contracted the disease, or very rarely. It is true that it is rare for attendants to become infected. Two cases have come under my observation.

To go back to the shifting of cases from State to State and from county to county: About 10 years ago I was sent down in Virginia to see a leper woman and examine her. She had gone there from Pennsylvania. I do not know what was finally done about her. I was simply sent down there to make a diagnosis of the case, and I knew nothing more of it.

The Chairman. What is your opinion as to the necessity for the passage of some such bill as this?

Dr. McCoy. I think undoubtedly some provision ought to be made for these floating lepers. I am inclined to think they would welcome it and take advantage of it.

Senator Works. If you take out the people already provided for in California, Louisiana, and Massachusetts, there are a very few left that can be reached—known lepers.

Dr. McCoy. Comparatively few. I am familiar with the California situation, because I lived there for a number of years, and I think the lepers would go to a national home. During the course of the hearing, Dr. Engman mentioned the situation in St. Louis. The hospital is full there, and if a diagnosis of leprosy was made, there would be no place to go.

The Chairman. There is no adequate place for them in St. Louis?

Dr. McCoy. No, sir. In San Francisco the hospital is practically full. That is not a State institution, but a city institution. A few months ago there was a leper in the State known to the health authorities. They did not want him. He did not apply to them, but the State health officer was trying to get the individual taken care of somewhere. The State authorities had no money. Alameda County provides a place very similar to the one in Los Angeles.

Senator Works. The accommodations are very inadequate.

Dr. McCoy. Very inadequate. This San Francisco asylum is a credit to the city, but it is not to be compared, so far as comfort and all other things go, which tend to make life bearable, to Molokai. At Molokai they have about 9 miles of range. In San Francisco they have a very restricted range, but the houses are well built and are comfortable.

The CHAIRMAN. Can you think of any other points, Doctor, that you wish to mention?

Dr. MCCOY. No other point occurs to me just now.

The CHAIRMAN. I will have the notes furnished you, and if you wish to add something, you may do so.

Dr. MCCOY. Thank you.

The CHAIRMAN. We will now hear from Dr. Rucker.

STATEMENT OF DR. W. C. RUCKER, ASSISTANT SURGEON GENERAL, UNITED STATES PUBLIC HEALTH SERVICE, CHIEF OF THE DIVISION OF INTERSTATE QUARANTINE.

Dr. RUCKER. Mr. Chairman, I would like first of all, with the permission of the committee, to address myself to the administrative features of the bill.

The CHAIRMAN. Very well.

Dr. RUCKER. These facts have not been brought up heretofore. First of all, I would like to speak of the bill and its provisions from the humanitarian standpoint.

In the Division of Interstate Quarantine, in the Bureau of the Public Health Service, we are constantly in receipt of a communication from States, from counties, from cities, and from individuals, relative to lepers. These lepers are a source of a great deal of expense, trouble, annoyance, and economic loss. But that phase of it is entirely overwhelmed by the humanitarian aspects of the case, the pitiable conditions in which these lepers find themselves.

In an address which I delivered last summer at St. Luke's Episcopal Church, in San Francisco, Cal., I said:

There is one disease for which our horror has not abated, the sufferers from which we treat as cruelly as we treated them a score of centuries ago. Yes, more cruelly, for the rapidity with which news is now transmitted makes possible a refinement of torture far beyond the imagination of former days. The one disease which we still regard with ignorant horror, whose victims we harry, ostracise, and drive from place to place, whose sufferers we condemn to a purgatory on earth and force to drain the cup of misery to the dregs, is leprosy.

"The foxes have holes, and the birds of the air have nests," but, like the Son of Man, the leper "hath not where to lay his head." In this broad Christian land, the continental United States, there are but three public institutions for the reception of persons afflicted with leprosy. One is in California, one is on an isolated island off the coast of Massachusetts, and one is in Louisiana. There is no place in the United States dedicated to the study of this disease, its mode of spread and the means of its prevention and its cure. Under existing laws all that the Federal Government can do is to forbid the interstate travel of leprous persons, and, when absolutely necessary, to confine them at isolated quarantine stations. In the Philippines and in Porto Rico we maintain large leper colonies where these unfortunates may receive care and an asylum from a world wherein, as 35 centuries ago, the rule is that "he is unclean; he shall dwell alone; without the camp shall his habitation be." In the United States proper there exists no single leprosarium able to adequately care for all the lepers in our country.

The fear of leprosy on the part of the general public is such that when a person is discovered to have the disease the fact is heralded by the press throughout the land; people avoid his presence, even quitting the town in which the sufferer lives; business is injured; the leper subjected to all manner of indignities, and he is finally forced to move to some other locality, there again to be made the target of ignorant cruelty and abuse. It is as though they were those "others" who had the "trial of cruel mockings and scourgings, yea, moreover, of bonds and imprisonment." Is it any wonder that these unfortunates sometimes seek escape in self-destruction, or that mothers have poisoned their children rather than to permit them to live in disfigurement and loathsomeness? Is it remarkable that in so many towns there is hidden away in some garret an unhappy victim of this horrible disease, one who never sees the light of day, or a face save that of his nurses, waiting in the sadness and torment of isolation the deliverance of death?

And, to add to the irony of this wretched picture, how many persons are made to bear this burden of pain who are not lepers at all, but sufferers from other diseases which might be cured by proper diagnosis and treatment, which their families withhold in fear of social ex-communication.

A few years ago the Surgeon General of the United States Public Health Service, realizing that something should be done in order to prevent the carrying of lepers from place to place, admitted a few cases to one of the quarantine stations. Here they were permitted to dwell in peace for several months, until a land-development company whose properties were located some 15 or 20 miles from the reservation found that their business rivals were using the presence of these few unfortunates as an argument to induce prospective settlers to purchase land elsewhere. This created so much feeling that the entire State delegation combined in such a vigorous protest that it was necessary to discontinue the practice, and this protest was made in the face of the fact that the State in question had sent more patients to the place than any other State in the Union. Is this preaching of good tidings unto the meek, the binding up of the broken-hearted, the proclaiming of liberty unto captives? Is this in keeping with the doctrines of One who "put forth his hand and touched him, saying, 'I will; be thou clean,' and immediately the leprosy departed from him?"

Whether it be from the standpoint of humanity, economy, or public health, it is our duty to create a haven wherein these tortured of body and of spirit may find a refuge.

I think I need say nothing more on the humanitarian aspect of this question.

From a public-health standpoint, this bill is of very great importance. At the present time it is practically impossible to collect any leprosy statistics in this country that are worthy of the name. Realizing that this bill was to come before Congress, the Surgeon General sent out shortly after the first of the year communications to all the 48 States and to 600 cities. Three hundred and four cities of the six hundred have responded up to date, and only two of the States. The figures which have been given are manifestly inadequate. They do

not even tally up with the other figures we have received indirectly from the States themselves.

Senator WORKS. What was the nature of that communication?

Dr. RUCKER. I have here a copy of the letter which was written to the health officer of each city, which I will read.

The CHAIRMAN. Very well.

Dr. RUCKER. It is addressed to the health officer and reads as follows [reading]:

It is desired to ascertain the reported prevalence of certain diseases during the calendar year 1915.

For this purpose there is inclosed a blank, and it will be appreciated if you will kindly have it filled in with the information for your city and returned in one of the inclosed envelopes.

You will find also inclosed a separate blank prepared for data regarding the number of cases of leprosy in your city. It is desired that special care be taken in the filling out of this blank, so that a complete census of the lepers in the country may be obtained. The question of the desirability of establishing a national leprosarium has been agitated recently by various groups of persons interested. It is important, therefore, that dependable information upon the number of lepers at present in the country should be at hand.

As the reports asking for notified cases and registered deaths of notifiable diseases calls for deaths registered, as well as the cases notified, space has been provided that the registrar may sign the report as well as the health officer. In those cities where the health officer is also registrar he should sign in each capacity.

The letter that was addressed to the States was practically the same, except that it says "States" instead of "city."

Up until February 10, 1916, 17 States have been heard from in response to circulars sent to all the States, in accordance with the letter to which I have referred. Of these only two have told us about their cases. These are Michigan and Minnesota. In Michigan there appear to be three cases reported as present December 31, 1914, namely, one at Bay City, one at Big Rapids, and one at Three Rivers. The same three cases are reported present December 31, 1915, but the health officer estimates that there are at least 15 cases in Michigan.

In Minnesota there were present December 31, 1914, 9, and 1 was added during the year 1915, making a total of 10. There is one case at Albert Lea, one at Cokato, one at Elbow Lake, one in Linden Township in Brown County, one at Maple Bay, two in Minneapolis, one at Montevideo, one in Moscow Township in Freeborn County, and one in St. Paul.

With the permission of the chairman, I will insert in the record a table showing the results obtained through the inquiries sent out.

The CHAIRMAN. We shall be very glad to have it.

(The table referred to is here printed in full as follows:)

Leprosy.

[Reports by States for 1915.]

States.	Present Dec. 31, 1914.	Reported during 1915.	Died or removed 1915.	Present Dec. 31, 1915.	Isolated under State control.	Isolated under local control.	Not isolated.
Michigan:[1]							
Bay City	1	.....	.....	1	.....	(?)	(?)
Big Rapids	1	.....	.....	1	.....	(?)	(?)
Three Rivers	1	.....	.....	1	.....	(?)	(?)
Total	3	.....	.....	[1] 3	.....	(?)	(?)
Minnesota	9	1	.....	10	(2)	(2)	(2)
Albert Lea	(?)	(?)	.....	1	(2)	(2)	(2)
Cokato	(?)	(?)	.....	1	(2)	(2)	(2)
Elbow Lake	(?)	(?)	.....	1	(2)	(2)	(2)
Brown County, Linden Township	(?)	(?)	.....	1	(2)	(2)	(2)
Maple Bay	(?)	(?)	.....	1	(2)	(2)	(2)
Minneapolis	(?)	(?)	.....	2	(2)	(2)	(2)
Montevideo	(?)	(?)	.....	1	(2)	(2)	(2)
Freeborn County, Moscow Township	(?)	(?)	.....	1	(2)	(2)	(2)
St. Paul	(?)	(?)	.....	1	(2)	(2)	(2)

[1] The Health Officer estimates at least 15 cases in Michigan.
[2] "In one sense, none; in another sense, all, because we advise how these cases shall be handled."
[3] "All cases, however, are practically isolated at home or in some institution. One case is isolated on a county poor farm."

To Feb. 10, 1916, 17 States have been heard from in response to circulars sent to all the States Jan. 15, 1916—J. V. L.

Dr. RUCKER. Up to February 10, 1916, 304 cities have been heard from in response to the letters sent out to 600 cities on January 22, 1916. These show cases in Ann Arbor, Mich.; Chicago, Ill.; Jersey City, N. J.; Los Angeles, Cal.; New Orleans, La.; New York City, N. Y.; Oakland, Cal.; Philadelphia, Pa.; Richmond, Va.; Sacramento, Cal.; St. Louis, Mo.; San Antonio, Tex.; San Francisco, Cal.; Washington, D. C.; and Wilkes-Barre, Pa.

With the permission of the chairman I will insert in the record a table showing the results of the inquiries sent out to the cities.

The CHAIRMAN. We shall be very glad to receive it.

(The table referred to is here printed in full as follows:)

Leprosy.

[Reports by cities for 1915.]

Cities.	Present Dec. 31, 1914.	Reported during 1915.	Died or removed 1915.	Present Dec. 31, 1915.	Isolated under State control.	Isolated under local control.	Not isolated.
Ann Arbor, Mich		1		1		1	
Chicago, Ill		2	1	1		2	
Detroit, Mich	1		[1] 1			[1] 1	
Jersey City, N. J		1		1		1	
Los Angeles, Cal	1	6		7		[2] 7	
Mount Vernon, N. Y		[3] 1	([3])	([3])			
New Orleans, La		9	9		9		
New York, N. Y	20			20		[4] 14	6
Oakland, Cal		1		1		1	
Pawtucket, R. I	1		[5] 1				
Philadelphia, Pa	1			1		1	
Pittsburgh, Pa		1	[6] 1				
Reno, Nev		[7] 1	[7] 1				
Richmond, Va		[8] 1		[8] 1		1	
Sacramento, Cal		2		2		2	
St. Louis, Mo	1	1		2		2	
San Antonio, Tex	15	1	1	15			15
San Diego, Cal		1	([9])	([9])	([9])	([9])	([9])
San Francisco, Cal	12	2		14		14	
Tacoma, Wash		1	[10] 1				
Washington, D. C	1			1		1	
Wilkes-Barre, Pa	1			1		1	

[1] Case died in August, 1915.
[2] Cases isolated under county control.
[3] Was a case from New York City treated by a Mount Vernon physician.
[4] Cases isolated in the Hospital of Department of Public Charities.
[5] Case died in March, 1915.
[6] Detained on premises on municipal hospital from Aug. 14 to Sept. 27, 1915.
[7] Case came from California and was promptly returned.
[8] Case present Dec. 20, 1915; not reported until Jan. 4, 1916.
[9] Disposition of case not reported.
[10] Case was in a Japanese who was deported after one month's isolation.

To February 10, 1916, 304 cities have been heard from in response to 600 circulars sent out January 22, 1916.—J. V. L.

Dr. RUCKER. From the report it is safe to say that leprosy at the present time exists in at least all of the States except 17. Whether or not there are other cases can not be said.

If a leprosarium is established, as the bill provides, it will be a means of getting statistics. It will take away the fear of giving statistics.

The second important thing the bill will do, from the standpoint of the Public Health Service, is that it will prevent the interstate migration of lepers.

I do not want to take up the time of the committee by repeating what others have said, but I will subscribe to the idea that lepers are driven from place to place and that they seem to desire to go from place to place. There is a certain psychology about this: When a leper has once been in the upper right-hand column of the front page of a newspaper he is often very anxious to get back again. We concede this to lepers as well as to people who are well.

The CHAIRMAN. Have you any specific instances which you could give us where inhuman treatment has been accorded lepers?

Dr. RUCKER. I could do it, but I think perhaps it would be better for me to insert it in the record when I look over my remarks rather than taking up the time of the committee now.

The CHAIRMAN. Very well. That will be satisfactory.

Senator WORKS. I think that fact is generally understood.

The CHAIRMAN. I think so myself, but I would like to have some specific cases.

Dr. RUCKER. The difficulty of the early diagnosis of this disease has been brought out by the experts who have spoken, but of course this shows how difficult it is to apprehend these cases at the time they undergo quarantine or immigration inspection.

The objection has been made that the bill would leave the entrance into the leprosarium entirely to the volition of the leper. I would invite the committee's attention to section 2 of the bill, and while I have no knowledge of the law, it would seem to me, as a layman, that it provides three methods by which people may be admitted to the leprosarium.

There shall be received in the said home, under regulations prescribed by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, any person afflicted with leprosy who presents himself or herself for care, detention, and treatment.

That is the first way—upon self-presentation.

Or he may be apprehended under authority of the United States quarantine acts.

That is the second way.

Or any prson afflicted with leprosy duly consigned to the said home by the health authorities of any State, Territory, or the District of Columbia.

That is the third way.

With the permission of the committee I will address myself for a moment to the second method. I will point out here the answer to another objection, namely, the authority for interstate transportation of persons, such persons being in the hands of the General Government. It seems to me that if this bill becomes a law Congress will confer this power:

The Surgeon General of the Public Health Service is authorized, upon request of said authorities, to send for any person afflicted with leprosy within their respective jurisdictions and to convey said persons to such home for detention and treatment, and when the transportation of any such person is undertaken for the protection of the public health the expense of such removal shall be paid from funds set aside for the maintenance of said home or homes.

Senator WORKS. There is one weakness in this bill, it seems to me, which will have to be covered. There is no machinery provided, no provision for determining the fact as to whether or not a given person is a leper or not. There should be some provision in the bill by which that can be determined. I suppose in Louisiana they have some sort of examination before anybody can be sent to the home.

The CHAIRMAN. I think so. This bill says—

or any person afflicted with leprosy duly consigned to said home by the proper health authorities of any State, Territory, or the District of Columbia.

Senator WORKS. That is only one case. That does not cover the other.

Dr. RUCKER. I will ask the Senator if he thinks that the first few words of section 2 attend to that. It says "that there shall be received in the said home, under regulations prepared by the Surgeon

General of the Public Health Service, with the approval of the Secretary of the Treasury, any person afflicted with leprosy." In other words, the Surgeon General, by regulation, determines the machinery for the admission of these people.

Senator WORKS. That is all right if Congress wants to allow the Surgeon General to make those rules. That is a thing that, it seems to me, ought to be pretty carefully guarded, so we won't put persons in this institution, if established, who are not lepers.

Dr. RUCKER. Section 3 says:

> That regulations shall be prepared by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, for the government and administration of said home and for the apprehension, detention, treatment, and release of all persons or inmates thereof.

In other words, Congress, by this bill, would clearly indicate that the machinery should be provided by such rules, to be promulgated by the Surgeon General of the Public Health Service, under approval of the Secretary of the Treasury.

Senator WORKS. The question is whether Congress will provide that machinery or leave it to the Surgeon General.

Dr. RUCKER. It would require a remarkably well gotten-up law, a very far-seeing law, that would meet all cases specifically.

Senator WORKS. There could be a very simple provision for the examination of persons suspected to be lepers, and this might, or should, provide by whom this examination should be made. I am merely offering these suggestions in order that they may be considered in the final framing of the bill. You want to take care of the lepers, and at the same time you want to be careful not to put people in there who are not lepers.

Dr. RUCKER. Of course there are a great many people who are lepers who would hardly need to be admitted to such an institution. Those are persons who are not dangerous and who are capable, by reason of their intelligence and means, to take care of themselves at their own homes. It would be ridiculous to suppose that every one of the lepers would be better off in the leprosarium than he would be in his own home.

Just another word in regard to the second method I have mentioned: This provides that a person may be admitted who presents himself, or he may be apprehended by authority of the United States quarantine act. There are on the statute books several acts, notably the act approved March 27, 1890, United States Statutes at Large, chapter 51, page 31, and the amendments thereto, and the act of February 15, 1893, which would grant ample authority for the apprehension of persons suffering from leprosy, either under regulations made in conformity with the act of February 15, 1893, or in conformity with the health regulations of the several States, which would be enforced in cooperation with those States.

Senator WORKS. I think it would be well to incorporate those statutes in the record here.

Dr. RUCKER. I will prepare them and insert them.

Senator WORKS. So they can be referred to in considering the matter further.

The CHAIRMAN. Yes.

Senator FLETCHER. I think that is right.

Senator WORKS. By whom was this bill prepared?

Dr. RUCKER. This bill was introduced by Mr. Ransdell. I don't know by whom it was prepared.

Senator WORKS. I was wondering if it was prepared by the Public Health Service.

Dr. RUCKER. I do not think it was. About a year and a half ago I prepared a draft of a bill, which was included in an address which I delivered at Atlantic City, but this bill does not bear a very close resemblance to that bill.

Senator WORKS. Perhaps the Senator himself prepared it.

The CHAIRMAN. No, I did not prepare it. It was presented to me, and I introduced it.

Dr. RUCKER. I would also like to invite the attention of the committee to the fact that the interstate-quarantine regulations which were promulgated May 15, 1912, have been superseded by a new set of regulations approved by the Secretary of the Treasury, under date of January 16, 1916, and which are still in the hands of the printer.

Section 29 provides that [reading]—

Common carriers shall not accept for transportation, nor transport in interstate traffic, any person suffering from or afflicted with leprosy, unless there has been obtained from the Surgeon General of the United States Public Health Service or his accredited representative a permit stating that said person may be received under such restrictions as will prevent the spread of the disease, and said restrictions shall be specified in each instance, provided that, in addition to the above, permit shall also be obtained from the health authorities of the States, Territories, or the District of Columbia, to or from which the patient intends to travel.

Senator WORKS. Upon what law did you found this?

Dr. RUCKER. Section 3 of the act approved February 15, 1893, provides that immediately after the act takes effect the Surgeon General shall examine the quarantine regulations of various States and municipal boards of health, and shall, under the direction of the Secretary of the Treasury, cooperate and aid in the enforcement and execution of the rules and regulations which the States and cities have made, and where there are insufficient regulations for the prevention of the spread of infectious or contagious diseases from one State or Territory to another State or Territory or the District of Columbia, the Surgeon General shall prepare the necessary regulations which shall be promulgated by the Secretary of the Treasury, and when the Secretary of the Treasury shall have promulgated such regulations, they shall be enforced by the State and local health authorities where they are willing so to do; but should they fail or refuse to enforce these regulations, they shall be enforced by the President.

Senator WORKS. That seems to settle very well the question we have been in so much doubt about here, as to the right of the Federal Government to transport these people to particular places and keep them there. If the Government can enforce such regulations as that, they can do pretty much anything they want to.

Dr. RUCKER. I fancy if Congress will give us the machinery we can handle the matter.

Senator WORKS. The question is whether the Federal Government has power to deal with the question as broadly as you indicate there.

Dr. RUCKER. Perhaps. There is just one thing in regard to that. This matter has already been tried out by the courts in San Francisco, where it was held that reasonable regulations issued under the act had the force and authority of law.

Senator WORKS. It is a question of whether it is reasonable or not?

Dr. RUCKER. I think it is. If I were a lawyer, my answer would be this: If it could be proved that a person suffering from the disease was a danger to the public health, then the regulation was good and sufficient. If, on the other hand, you could not prove that a person suffering from the disease was dangerous to the public health, the regulation would fall.

Senator WORKS. I am inclined to agree with that if it is an interstate or an international question, the Government has to deal with it; but if it is purely a State question the National Government has no more right to deal with it than I have.

Dr. RUCKER. Suppose the patient is willing to go?

Senator WORKS. That is no foundation. You can not have jurisdiction of anybody on his request or invitation to go into a State. That is a State matter. That is not a matter for the Federal Government.

Dr. RUCKER. Has the State power to delegate any of its authority?

Senator WORKS. Not to the National Government.

Dr. RUCKER. Or to any representative of the National Government?

Senator WORKS. No; the National Government's authority is limited, and it can not extend it by request of a State.

Dr. RUCKER. I would like to continue that, but I do not know as much about it as you do.

The CHAIRMAN. I would like to ask you a further question, Doctor.

Dr. RUCKER. Yes.

The CHAIRMAN. Have you made any estimate as to the probable cost of a leprosarium? This bill calls for $250,000. What will that accomplish?

Dr. RUCKER. It would be impossible to make an estimate at the present time, because, as a matter of fact, the present knowledge or lack of knowledge as to where the leprosarium is to be located, if it is to be established, makes it very difficult. The location would be a matter to be taken into consideration in saying how much it would cost. The question will arise as to whether or not it will be necessary to purchase the land, and that will make a great deal of difference. There is also the question, still undetermined, as to how many patients we are going to have. It would seem to me that the amount allowed in this bill would be enough to make a proper beginning, and I believe that it can be administered in that way.

At this point it might be well to refer to the economic aspect of the question. I believe that the concentration of these lepers in this way would be a great measure of economy. The overhead charges for the care of one leper are nearly as great as would be the overhead charges for the care of 50 lepers. The bill calls for $250,000. Now, let us suppose that that $250,000 will secure the land, erect the buildings, and care for the patients therein for one year. Let us suppose that the amount of money is equally apportioned between the States, because eventually it comes from the citizens of our country; and let

us suppose, without regard to population, that it is divided into 48 parts. In other words, this division gives each State a little over $5,200 to care for its lepers for one year. In the case of Massachusetts, for example, they have 11 lepers. It would give the State of Massachusetts, under that arrangement, $473 for every one of its lepers. Dr. Parker in his testimony yesterday stated that it cost the State of Massachusetts $28,000 annually for the care of its lepers. There are 11 lepers there. In other words, it costs the State of Massachusetts $2,545 per annum for each of its lepers. There would be an economy, figured on this rough approximation, of the difference between $2,545 and $473.

Senator WORKS. If those unfortunates can be taken care of adequately and thoroughly by this means, I think we had better not stop to count the dollars.

Dr. RUCKER. I quite agree with you, sir. At the same time, the question of economy is one that ought to be taken into consideration and given some weight. Not only are the States and municipalities heavily taxed in order to care for these people, but they also suffer in other ways. We all know that the presence of a leper in a community hurts business. When a leper was found in Bay City and escaped to a near-by town, business in that town practically suspended there the entire time that man was in that town. That thing has not happened just once, but many, many times.

It seems to me that the bill is a wise one, that it is absolutely necessary in order that we may have public health protection, and that we may fulfill our humanitarian duties toward these people, and that we may meet the economic aspects of the case.

The CHAIRMAN. Do you think of any other points now, Doctor, that you ought to cover?

Dr. RUCKER. I think of nothing, unless the committee desires to ask me some further questions.

The CHAIRMAN. We are very much obliged to you, Doctor.

(Whereupon, at 4.30 o'clock p. m., the committee adjourned sine die.)

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